5-3895-353-14+P

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

Including Repair Parts Information and Supplementary Operating, Maintenance and Repair Parts Instructions

FOR

ROLLER, VIBRATORY,

SELF-PROPELLED

(CCE) MODEL SP-848

NSN 3895-01-075-2823

HEADQUARTERS, DEPARTMENT OF THE ARMY
APRIL 1981

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NO. 5-3895-353-14 & P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC *24 April 1981*

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS INFORMATION AND SUPPLEMENTAL MAINTENANCE AND REPAIR PARTS INSTRUCTIONS) FOR ROLLER, VIBRATORY, SELF PROPELLED (CCE) MODEL SP-848 NSN 3895-01-075-2823

REPORTING OF ERRORS

You can help improve this manual by calling attention to errors and by recommending improvements and by stating your reasons for the recommendations. Your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in the back of this manual should be mailed directly to Commander, US Army Tank-Automotive Materiel Readiness Command, ATTN: DRSTA-MBS, Warren MI 48090. A reply will be furnished direct to you.

SECTION I OPERATION MAINTENANCE

II. REPAIR PARTS

III. REPAIR PARTS FOR ENGINE ASSEMBLY

IV. SUPPLEMENTAL OPERATING, MAINTENANCE AND REPAIR PARTS INSTRUCTIONS

AUTHENTICATION STATEMENT

This technical manual is an authentication of the manufacturers' commercial literature and does not conform with the format and content specified in AR 310-3, Military Publications. This technical manual does, however, contain available information that is essential to the operation and maintenance of the equipment.

SECTION I

OPERATION MAINTENANCE

FOR

SELF-PROPELLED VIBRATORY ROLLERS

REGISTRATION NUMBERS UBOOFL TO UBOOHF

SP 848

NSN 3895-01-075-2823

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IMPORTANT

The instrument panel is provided with protective covers for use during periods of inactivity and fitted with eyelets for a locking device. The fuel tank filler cap is also fitted with eyelets. It is recommended that locks be used on these items, if deemed necessary, to prevent damage or vandalism.

SERVICE

When ordering repair parts or requesting service for the Vibratory Roller, always furnish the Machine Serial Number with your request.

Consult Milwaukee Service Department for instructions pertaining to the return of "Sundstrand" hydrostatic pumps and motors.

GENERAL SAFETY RULES

Read this manual before operation. Your safety and the safety of those around you depends upon your using care and good judgment in the operation and maintenance of this machine. Know the positions and functions of all controls before attempting to operate.

All equipment has limitations. Understand the speed, hydrodynamic braking, steering, stability, and characteristics of the machine in a safe area before starting to work. The following are general safety comments that apply to this equipment. Review them.

Avoid loose clothing, particularly cuffs and scarfs.

Know what safety equipment is required and use it. A hard hat, safety glasses, reflector type vest, and respirators are the types of equipment you may need.

Know any hand signals that may be used and who is responsible for signaling.

If you are roading the machine, know what wamings must be placed on the machine and if you will have an escort.

Warn all personnel who may be servicing or in the path of the machine.

Correct or report any apparent machine defects.

Check to see that any guards, etc. are secure and in place.

Note any hazards or obstructions that may be encountered such as ditches, overhead wires, blocks, etc.

Keep deck floor clean, which otherwise may become cluttered or slippery. Keep steps and grab handles free of oil and grease.

Insure proper ventilation if starting indoors.

Be particularly careful if this is not the machine you would normally operate.

Never leave machine unattended with engine running.

Park in a clear authorized area and set parking brake before dismounting. Use and lock protective operating counsel covers.

Secure all caps and filler plugs for fuel, oil, hydraulic fluid, battery covers and radiator.

Know levels for engine coolant, lubricating oil, and fuel tank.

Secure and lock seat. Use safety belt, if required.

Always place controls in neutral and lock parking brake before starting.

Test steering, right and left, while moving slowly.

Test hydrodynamic braking while moving slowly.

Listen to engine and transmission while moving slowly to determine any unusual noises.

Report any defect in machine noted during operation.

Observe instruments and gauges frequently.

Do not permit riders on machine.

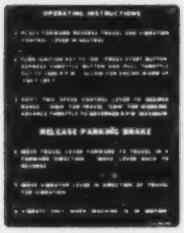
Know and observe any traffic flow patterns on your job and obey flagman, road signs or signals.

Do not adjust machine with engine running.

Do not open any hydraulic lines that are under pressure or too hot to touch.

Do not smoke while in the process of refueling.

Lock steering lock link when working on machine.



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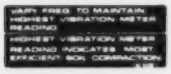
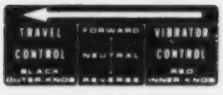

VARY FREQ. TO MAINTAIN HIGHEST VIBRATION METER READING
HIGHEST VIBRATION METER READING INDICATES MOST EFFICIENT SOIL COMPACTION

F



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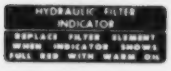

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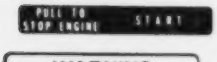

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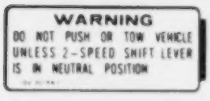

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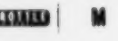

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WARNING

CLEARANCE CLOSES

STAND CLEAR AND DO NOT STAND ON LADDER WHEN ENGINE IS RUNNING.

USE STEERING FRAME LOCK WHEN SERVICING MACHINE.

B

A

INSTRUCTION PLATES & LABELS

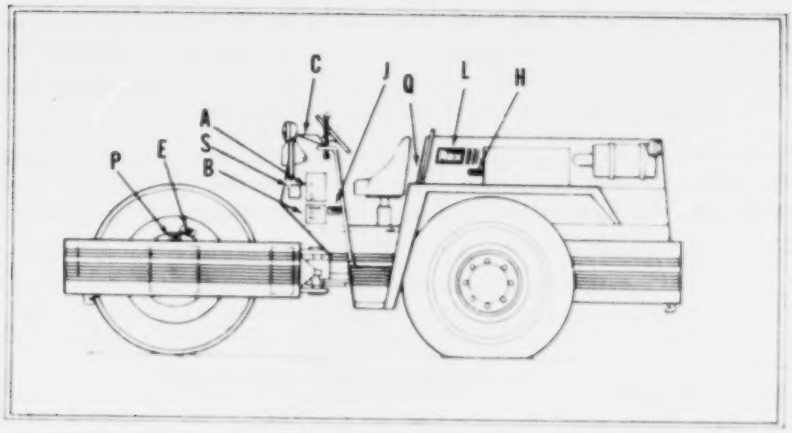
MODELS 848

A	102-04650-01	LUBRICATION PLATE
B	102-04708-01	WARNING LABEL
C	102-30199-01	OPERATING INSTRUCTIONS
D	102-01282-01	SERIAL/MODEL NO. PLATE
E	102-03248-01	LUBRICATION PLATE
F	102-09200-01	VIBRATION LABEL
G	102-30189-01	CONTROL LABEL
H	102-08699-01	FILTER INDICATOR LABEL
I	102-30190-01	ENGINE CONTROL LABEL
J	102-30194-01	WARNING PLATE
K	102-30186-01	FREQUENCY ADJ. STOP LABEL
L	402-01749-02	NAME PLATE – REX
M	102-09222-01	THROTTLE LABEL
N	102-09220-01	LIGHTS LABEL
O	102-08744-01	V.P.M. LABEL, 1800
P	102-09064-01	PNEUMATIC ISOLATOR
Q	102-30193-01	2 SPEED CONTROL
R	A2L-24-245	EAR WARNING PLATE
S	A2L-24-246	LIFT & TIE PLATE
T	A2L-24-247	DATA PLATE

R

S

T



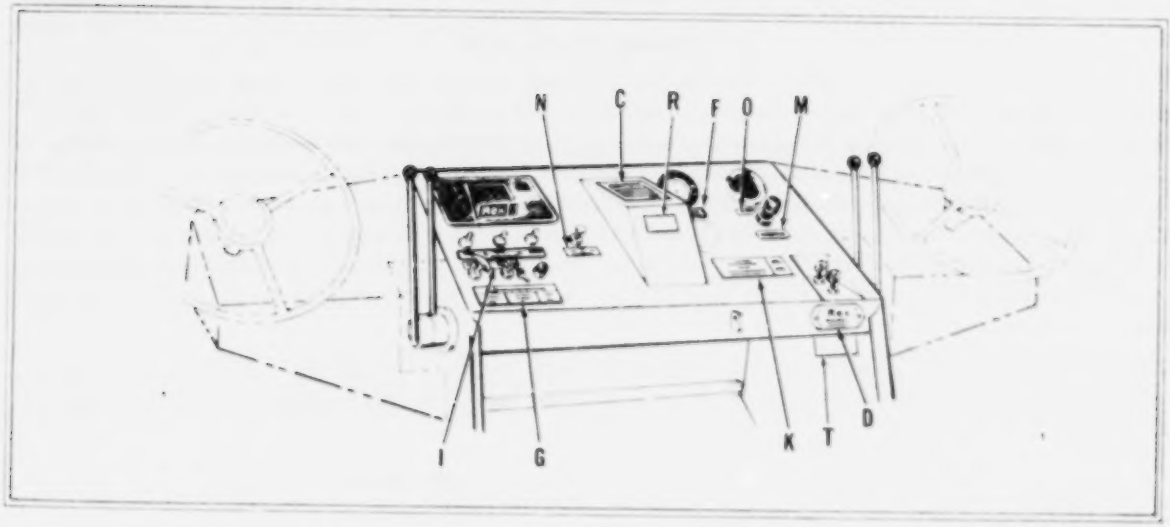


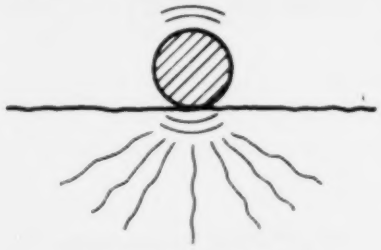
FIGURE 1

GENERAL:

Vibratory compaction is the art of densifying or increasing the unit weight of a material mass through the application of dynamic forces, with the expulsion of air and in some cases moisture. The extent to which a material can be compacted depends on the characteristics of the particular material, the amount of force used to compact it, and the moisture content of that particular material.

Compaction is necessary in order to form a stable foundation for any structure in which a future decrease in volume of the material will be detrimental. This covers highways, buildings, and other structures. However, there are actually two purposes to compaction; one is to consolidate material to avoid future settlement, while the other is to build strength into the material.

FIGURE 2

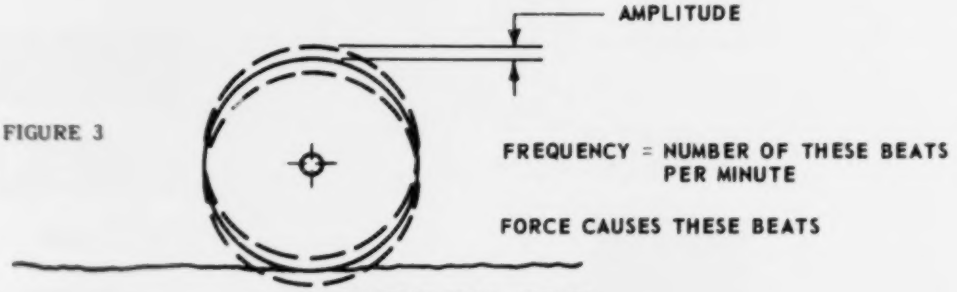


DYNAMIC COMPACTION

The theories advanced on vibratory compaction are numerous; and in many cases varied. However, it appears that the most efficient compaction by vibration occurs at or near the material resonance point. These resonance points vary among material types with the range of 1200 to 1800 vibrations per minute covering most of the materials in which vibratory rollers are effective. Functionally vibratory compaction is the interrelationship of three factors: frequency, amplitude, and force. Frequency is the number of vibrations per minute while amplitude indicates the vertical distance the vibrating roll travels from a theoretical center to its maximum distance from this center. Total vertical movement is technically double-amplitude, although in some cases may be referred to simply as amplitude. Amplitude is greatest when the roll is vibrating at material resonance.

Vibratory force is usually generated by a rotating eccentric weight. Although this centrifugal force acts radially in all directions from the center of the roll, only the vertical or near vertical components are used to compact.

FIGURE 3



VIBRATORY ROLL ACTION

Vibratory compaction is suited to granular type soils and in these materials will give excellent compaction results. Vibratory rollers are basically a deep type of compactor in soil; that is, they can compact deep lifts. Smooth roll vibratories may, however, leave the top inch of the surface loose in granular soils. This is generally attributed to the horizontal vibrations traveling along the soil surface. This uncompacted surface can be readily compacted with the roll in a non-vibrating condition.

The density requirement for the material to be compacted is predetermined by the engineers in the soil laboratory. From these lab tests a given density standard for this material will result. Field tests will insure compaction to this standard.

For trouble shooting, refer to pages 11

The normal method of operation is in a "back and forth" pattern. On short runs, the shuttle method is used without turning around. On long passes, the turn-around method may be used.

Field testing the compacted area will determine the number of passes and selection of frequency required.

The frequency range is listed below*. Always compact in low range – 0 to 5 MPH. High range, approximately 12 to 16 MPH, is used for travel only to a different site over smooth surfaces. Always stop machine and set parking brake before changing transmission speed range because hydrodynamic braking is inoperative when transmission is in neutral. NOTE: For ease of shifting, jog travel lever, with engine at low idle.

For the first passes, use lower frequency – 1200-1500 vibrations per minute. For "tender" type soils or weak foundations, use lower frequency also – 1200-1300 vibrations per minute on first passes.

Frequency (VPM) can be read on the Vibration Frequency Gauge affixed to the instrument panel. To change frequency, move the Vibration Control Lever. The further the lever is moved away from "neutral", the higher the frequency, either forward or reverse travel.

REX VIBRATION METER

The vibration meter measures the amplitude of roll vibration and this amplitude is indicated on the Vibration Meter Gauge. The higher the meter reading, the greater the amplitude. Popular theory indicates that the maximum amplitude occurs at or near the point of soil resonance; and at this point of soil resonance, compaction is most efficient.

Soil resonant frequency can vary with the type of soil, inherent soil moisture, and degree of compaction. Thus the soil resonant frequency can change with successive passes of the compactor.

To utilize the Rex vibration meter, the operator adjusts the frequency at the beginning of the pass to maximum amplitude by reading the highest meter indication. This will serve as a guide to obtain the most efficient operation. The vibration meter is especially valuable as a guide where high densities are difficult to obtain.

*FREQUENCY RANGES

SP848 ..... 1200-1800 VPM

CAUTION

***REXNORD** assumes no liability for any damage due to vibrations transmitted by REX Vibratory Rollers.*

This is an area that is unpredictable unless all soil and subsoil conditions are known. The manufacturer of this equipment can only alert the equipment operator that good judgement has to be exercised when compacting close to structures. Any vibration propagation may have to be checked before proceeding.

PREPARATION OF VIBRATORY ROLLER FOR USE SP848

1. Check for shortage or damage. When the machine is received from the carrier, complete inspection for damage should be made. Initiation of claims, if any, shortage or damage, should be made at this time. A description should be made on the freight bill.

2. Disconnect the steering lock link (painted red) between roll frame and main frame. Refer figure 5 .

3. Remove any protective material that may be covering instrument panel gauges, plates, open ports, etc.

4. Battery is shipped dry. Fill with electrolyte (provided) to level. Check battery cables for tightness and proper polarity. See page 76.

5. Clean off excess paint or grease from steering cylinder rod.

6. Refer to engine manual to prepare engine for running.

7. Fill engine fuel tank.

8. Prestart-up inspection:

CAUTION

If roller is to be pushed or towed, the two speed transmission (shift lever) must be in neutral position.

a. Check oil level in hydraulic oil reservoir. (Sight gauge.)

b. Check oil level in the 2-speed transmission case. See Lubrication Chart.

c. Check oil level in axle differential and wheel ends. See Lubrication Chart.

d. Check air pressure in tires.

23.1 x 26 diamond tread – 15 PSI (SP848)

e. Check air pressure in pneumatic isolators – 25 PSI.

f. Grease all fittings. See Lubrication Chart.

g. Vibrator bearings (one each side of roller drum) requires special grease. *Fill grease gun (provided) with Shell Darina EP-2 cartridges (#502-223-80) shipped with machine. Lubricate two (2) vibrator bearings with ten (10) strokes of gun, each side. Place gun in tool box.

9. Check maximum frequency setting – both forward and reverse.

a. Maximum frequency:

SP848 – 1800 VPM

b. Check maximum frequency with engine at full throttle (2450 RPM). If maximum frequency setting is not correct, adjust stop screws on Sundstrand pump lever. Pump is at flywheel end of engine and is accessible from below. See page 17.

10. Check operation of controls.

a. Check neutral points – adjust below instrument panel, if necessary.

b. Check operating friction: Adjust cable brake, one on each cable below instrument panel. Tighten just enough so that the control handle will hold its position.

11. Check operation of vibration meter: Gauge reading on instrument panel should generally read between "1" and "8" while vibrating.

*Darina grease cartridges (P/N S02-223-80, 10 pack) may be ordered from Rexnord Inc., Milwaukee.

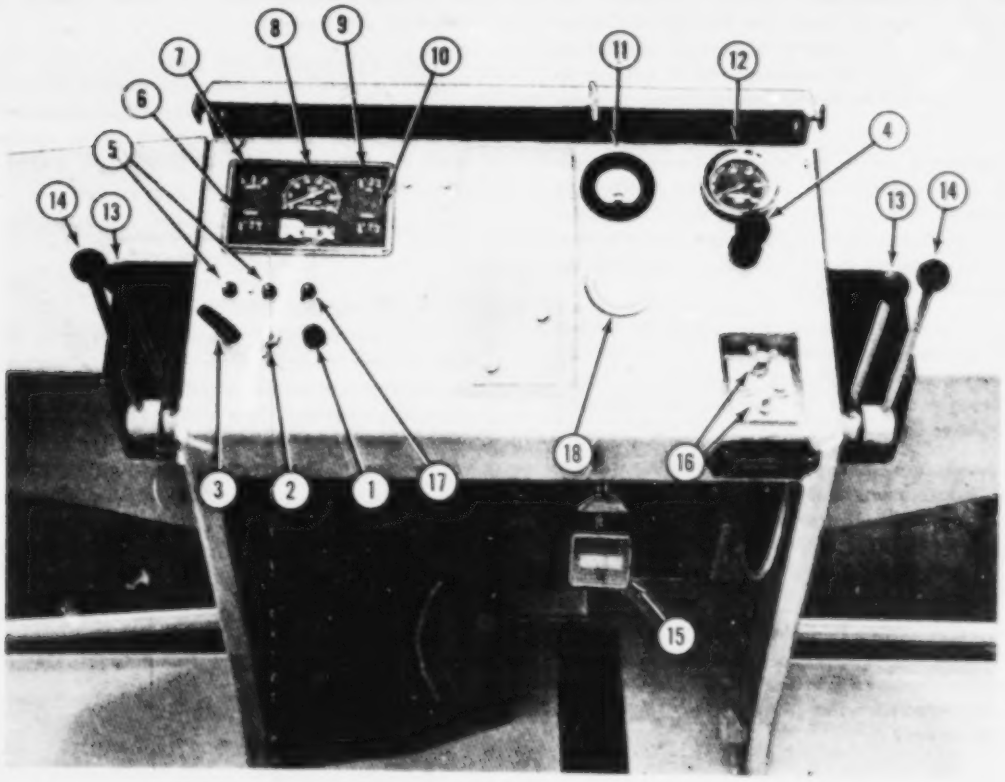


FIGURE 4

NOTE: The instrument and control counsel shown in figure 4 is of a SP900 "Asphalt" Roller. The SP848 and SP1300 "Soil" Rollers do not have items 5 and 17. Also for the Soil Rollers, the steering wheel is located in the center of the counsel. The SP900 has Duel Steering.

1. START BUTTON
2. IGNITION KEY
3. ENGINE SHUT-DOWN
4. ENGINE THROTTLE
5. SPRINKLER SWITCHES, WATER (SP900)
6. TEMPERATURE GAUGE
7. AMMETER GAUGE
8. ENGINE SPEED (RPM)
9. OIL PRESSURE GAUGE
10. FUEL GAUGE
11. VIBRATION METER GAUGE
12. FREQUENCY GAUGE VPM
13. VIBRATION CONTROL LEVER
14. FORWARD-REVERSE TRAVEL LEVER
15. EMERGENCY OR PARKING BRAKE
16. EXCITER ADJ. SCREWS
17. SPRINKLER SWITCH, DIESEL (SP900)
18. ACCESS CAP, BRAKE CYL. FILL

OPERATION (Fig. 4)

NOTE: In addition to the Operation Procedure, it is suggested that the "Application and Trouble Shooting Guides" be reviewed as a "matter of operational procedure".

A. Start-Up

1. Place the Forward-Reverse Travel Lever (14) in neutral (detent position) and the Vibration Control Lever (13) in neutral (detent position). Detent is center position.

2. Turn Ignition Key (2) to "on". Press Starter Button (1) to start and allow engine to warm up (160°-185°F operating temperature) at approximately 1000 RPM. Depress Engine Throttle Button (4) and simultaneously pull handle out until 1000 RPM is indicated on Indicator (8). IMPORTANT: If after two or three attempts to start and engine does not start, refer to Engine Manual under "Engine Starting Instructions".

CAUTION

Engine and hydraulic oil system must be allowed to warm up before applying load.

3. After warm-up, move Engine Throttle (4) up to approximately 2400 RPM. Turning the knob of Throttle (4)

will cause minor adjustment in RPM's. If roller is to TRAVEL (not compact), place the Two-Speed Control Lever in "high range", located to the right and behind operator. High range is for traveling only. If roller is to compact, place the Two-Speed Control Lever in "low range".

4. For compacting, move the Forward-Reverse Travel Lever (14) up to approximately 2 MPH. (The 2 MPH must be estimated as compared to a "slow walk" since the machine is not equipped with a speedometer. The further the lever is moved forward, away from neutral, the faster the machine will travel.)

5. Engage vibrator by moving the Vibration Control Lever (13) forward away from neutral. The further this lever is moved away from neutral, the higher the vibration frequency which can be read on the Vibration Frequency Gauge (12).

6. To reverse direction – move the Vibration Control Lever (13) back to neutral. Move Forward-Reverse Lever (14) back to neutral. Hydrodynamic braking will occur. It is recommended not to use the Brake (15) for repeated stops as the brake is used for parking or emergency stops only.

7. When machine comes to a complete stop, move the Forward-Reverse Lever (14) back reversing direction. Move Vibration Control Lever (13) back reversing rotation of the eccentric shaft within the steel roller. Resume compaction.

IMPORTANT

Always move the Travel Control Lever and the Vibration Control Lever in the same direction when rolling, either forward or reverse.

With the control levers together, in either direction, the vibrator shaft should always rotate opposite the direction of travel. If it does not, reverse the high pressure hoses to the vibrator motor. To check the direction of the vibrator shaft rotation, remove the right hand side cover on roll frame and the cap covering the end of vibrator shaft.

B. Shut-Down

1. Return the Vibration Control Lever (13) to neutral and the Forward-Reverse Lever (14) to neutral. Return Engine Throttle (4) to idle by depressing button and pushing down on lever. Allow engine to cool at idle for approximately five minutes. Pull out Engine Shut-Down Lever (3) to stop engine. Turn Ignition Key (2) to "off".

2. Depress Parking Brake (15) Lock. Connect steering lock link. See figure 5 .

3. When shifting the two speed lever from "low" to "high" or vice-versa, bring the machine to a stop and set parking brake before shifting. (Hydrodynamic braking is inoperative when transmission is in neutral.) For ease of shifting, jog travel lever, with engine at low idle, while shifting.

WARNING

STEERING LOCK LINK (Fig. 5)

The steering lock, when connected prevents the steel roll from accidently turning. This link must be connected and pin locked when servicing the machine or if the machine is being transported. It is also recommended to lock the roll after the days operation as a safety precaution.

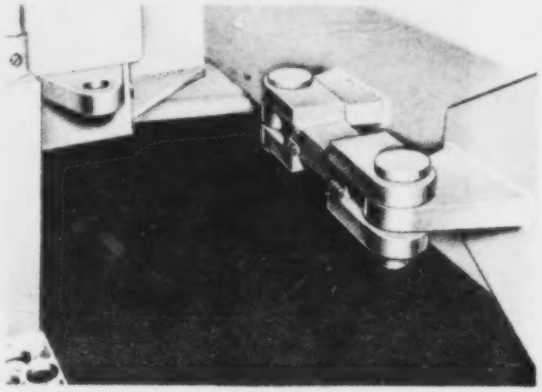


FIGURE 5

ROLL AND TIRE SCRAPERS (Fig. 6)

The steel roll is equipped with two rubber scrapers which must be hand adjusted from time to time due to normal wear. Adjust scraper as required and reverse when worn for double use.

Nylon, spring loaded scrapers are provided for the smooth tires. Lock scrapers back when machine is not used to roll asphalt surfaces.

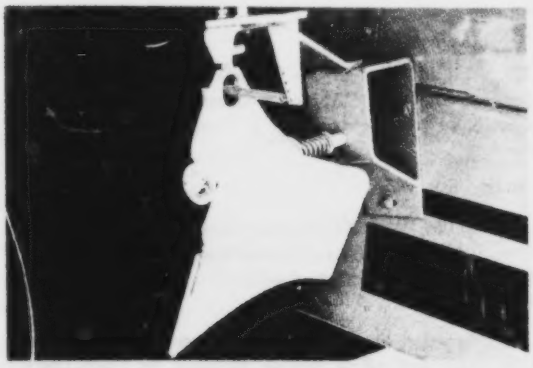


FIGURE 6

APPLICATION AND TROUBLE SHOOTING GUIDES

*I. SP848 – Used on Granular Soils or *Crushed Stone*

A. Basic Information

1. Adjust vibration frequency to be "in tune" with soil.
   a. Well graded soils generally use 1700-1800 vibrations per minute.
   b. Tender soils (clean sand, etc.) can use vibration frequencies as low as 1300 vibrations per minute.
   c. *Crushed stone generally requires 1700-1800 vibrations per minute.
   d. Use the vibration meter.
2. Always move the travel control lever and the vibration control lever in the same direction when rolling, either forward or reverse. With control levers together, in either direction, the vibrator shaft should always rotate opposite the direction of travel. If it does not, reverse the high pressure hoses to the vibrator motor. To check direction of vibrator shaft rotation, remove right hand side cover on roll frame and the cap covering end of vibrator shaft.
3. Operate vibrator only when the roller is in motion.
4. Soil surface should be relatively smooth and level for best compacting results. (Use of motor grader, etc.)
5. Travel speed range of 2-4 MPH is generally most efficient. (Use low travel gear range when vibrating.)
6. Maintain suitable tire pressure for good traction. (23.1 x 26 Diamond tread tire)
   a. On well graded soils – 16 PSI.
   b. On sandy soils – as low as 11 PSI.
7. Use proper lift thickness for most efficient compaction.
   a. The higher percentage of "binder", the thinner the lift.
8. *This vibratory roller is not designed for heavy rock compaction – for heavy rock compaction, use the Rex Model SP1300.

*Consult Milwaukee Engineering Dept. for further information.

Cont'd. on page 12

B. Possible Application Problems

PROBLEM	SOLUTION
1. Not achieving specified density.	A. Frequency too high or too low – Use vibration meter or follow guide line stated above. B. Too few passes. C. Too many passes – density can be achieved and lost with too many passes. D. Laboratory density is not correct.
2. Loose, rough surface after last pass.	A. Too high a frequency on last pass – use 1200 vibrations per minute or no vibration to tighten surface.

HYDRAULIC SYSTEMS

1. Vibrator Control. Figure 7 . The vibrator control system consists of a positive displacement axial piston pump coupled to the engine flywheel; a positive displacement gear type motor coupled to the eccentric drive on the roller shaft; hydraulic lines and vibrator control on the operator's console.

2. Traction. Figure 8 . The hydrostatic drive Vibratory Roller consists of a diesel engine for power, a variable displacement piston type pump which is connected to the engine crankshaft. A fixed displacement, piston type motor is coupled to the two-speed case on the axle differential; hydraulic lines, oil reservoir, filter, oil cooler and controls.

REFERENCE FOR FIGURE 7B

NO. 1 – CHARGE PRESSURE GAUGE PORT
NO. 2 – HIGH PRESSURE GAUGE PORT FOR ITEM 6
NO. 3 – HIGH PRESSURE GAUGE PORT FOR ITEM 5
NO. 4 – SHUTTLE VALVES
NO. 5 – HIGH PRESSURE RELIEF VALVE
NO. 6 – HIGH PRESSURE RELIEF VALVE

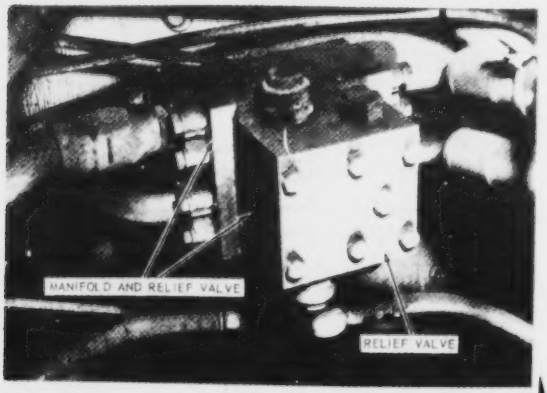


FIGURE 7A

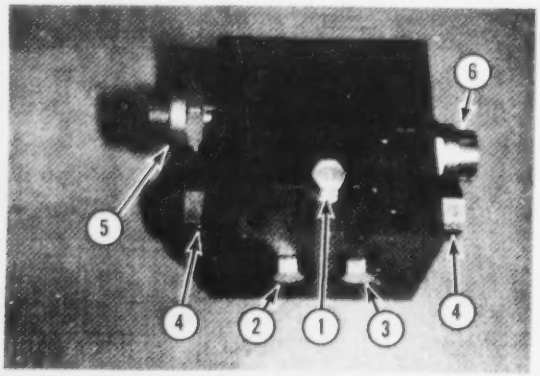


FIGURE 7B

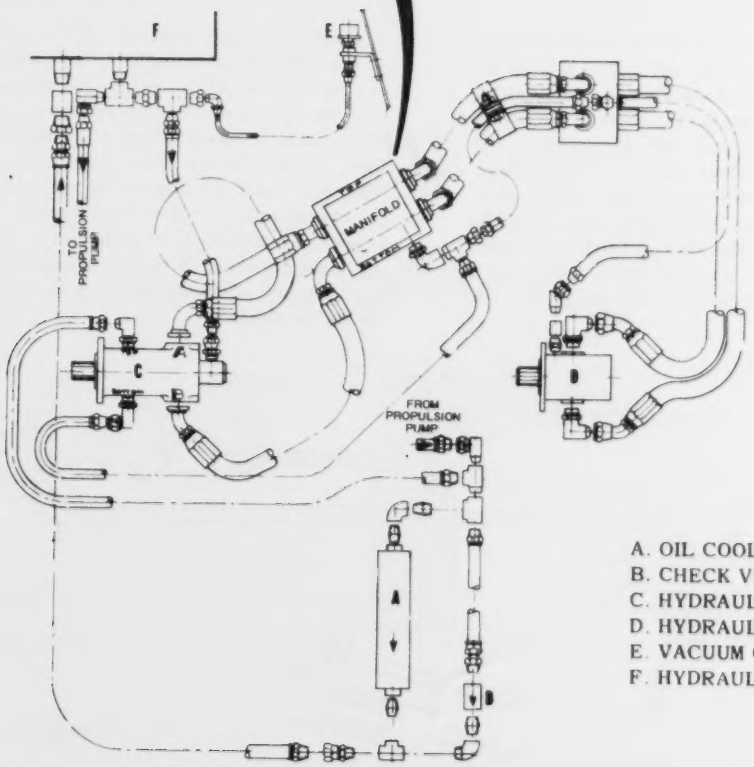
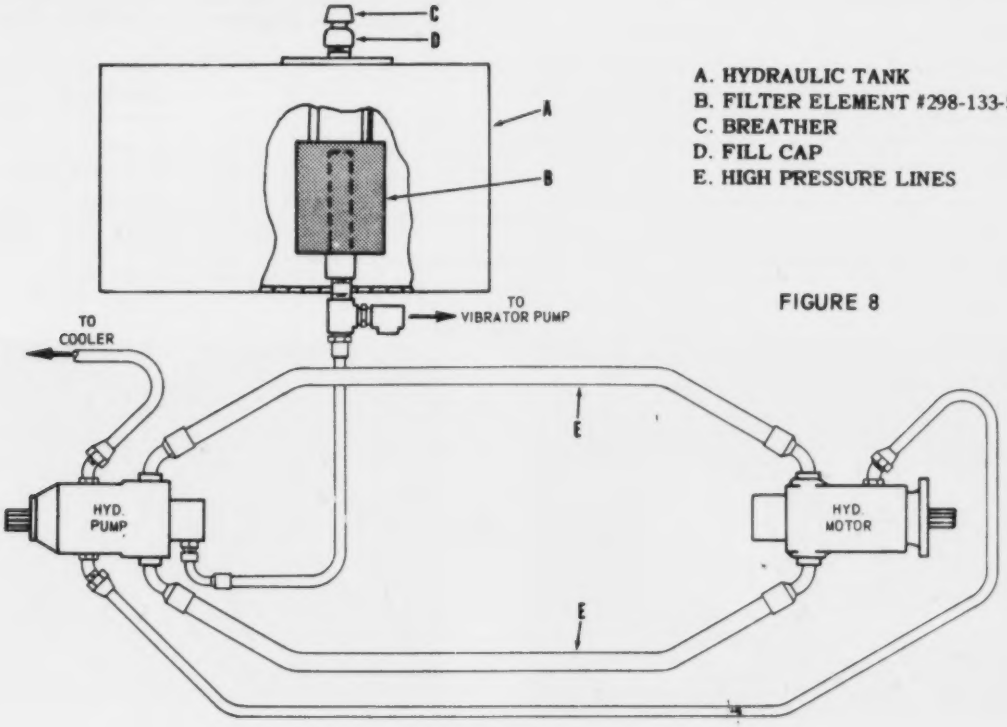


FIGURE 7

A. OIL COOLER
B. CHECK VALVE
C. HYDRAULIC PUMP
D. HYDRAULIC MOTOR
E. VACUUM GAUGE
F. HYDRAULIC OIL TANK



A. HYDRAULIC TANK
B. FILTER ELEMENT #298-133-53
C. BREATHER
D. FILL CAP
E. HIGH PRESSURE LINES

FIGURE 8

The variable displacement pump has a neutral position in which no fluid is pumped to the motor. Moving the travel control lever on the operator's console to either side of neutral, while the engine is running, causes oil to be pumped to the motor; one side turning the motor in forward travel and the other side in reverse travel. The further the control lever is moved from neutral position, the faster the Roller will travel. Changing the engine throttle speed will also change the Roller speed providing the pump control lever is not in neutral position. If lever is in neutral position, the Roller will not move.

3. Power Steering. Figure 9 . This system consists of a rotor type pump mounted to a bracket on the engine and belt driven off the engine fan pulley, an "Orbitrol" steering unit, double acting hydraulic cylinder and suitable hydraulic hoses. Turning the steering wheel to the right causes the oil under pump pressure, through the "Orbitrol" unit, to flow to the cylinder bottom, forcing the cylinder piston rod to extend out of the cylinder and in turn forces the roll to be turned to the right. Turning the steering wheel to the left causes oil to flow to the top of the cylinder, forcing the piston down, thus pulling the roll to the left.

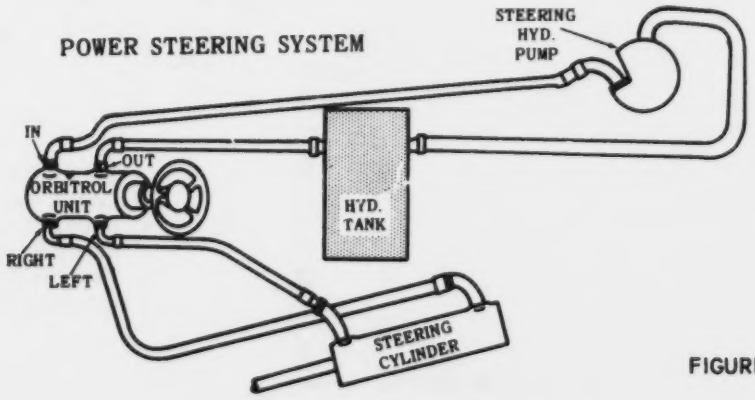


FIGURE 9

VIBRATION FREQUENCY ADJUSTMENT
SP848 (Figure 10)

Prior to the machine leaving the factory, the vibration frequency is adjusted and set for maximum ("A" VPM below) at full governed engine throttle, in forward and reverse. This setting is made after the oil is allowed to warm up (160°-185°), usually after about one-half hour of engine warm up.

If the vibration control lever is actuated to its maximum stroke at start-up, and the oil is cold, the frequency will go as high as ("B" VPM below) at full engine throttle. The frequency will drop down as the oil temperature rises.

Upon receipt of a new machine and/or to recheck the maximum frequency of a machine already in use, adjustment is as follows:

The machine must be on level ground. Set parking brake.

Place the Forward-Reverse Lever in neutral (center) and the Vibration Control Lever in neutral (center).

Start engine and allow to warm up (160°-185° operating temperature). Shut off engine. Make no adjustments with the engine running.

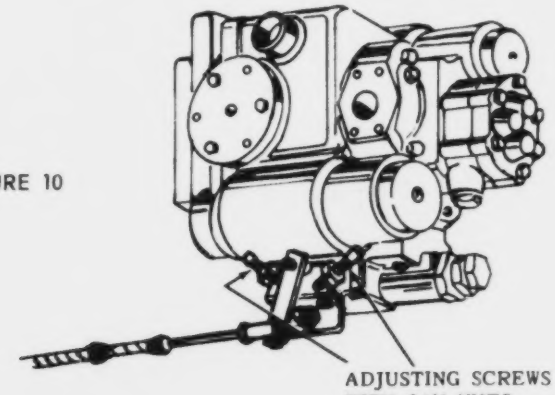
Figure 10 . The adjusting setscrews, for frequency adjustment, with jam nuts, are located on the hydrostatic pump and can be reached from underneath and just behind the floor board.

Again start engine and bring up to full throttle.

Move the vibration control lever to its maximum travel position forward and observe the frequency reading on the gauge. Repeat this procedure in reverse. If an adjustment is necessary, return the vibration control lever to neutral and shut down engine. Reposition adjusting screws if necessary to obtain proper frequency in forward or reverse. ⅛ to ¼ turn of the adjusting screw equals approximately 100 VPM. Relock adjusting screw with jam nut.

Again start engine and recheck frequency as in "A" VPM below, in both forward and reverse.

FIGURE 10



MODEL	"A" FREQUENCY (WARM OIL)	"B" FREQUENCY (COLD OIL)
SP848	1800-1825 VPM	1900 VPM

STEERING CYLINDER REPAIR (CROSS) Fig. 18

1. Clean hose connections at cylinder ends. Remove hoses and plug hose ends.

2. Remove cylinder from machine. Cylinder may be gripped in a lead jawed vise at the base end.

3. Remove three bolts (A) from head cap (B) and remove head cap from cylinder tube (C) and rod (D).

4. Push head (E) into cylinder tube past retainer ring (F). Remove retainer ring. Pull entire piston rod assembly out from tube. Remove head (E) from rod (D).

5. Inspect inside of tube (C), head (E), rod (D) and piston head (M) for score marks. Replace where necessary.

6. "O" ring (G) can be replaced by removing nut (H) and piston head (M). Pry out T-ring seal (J) and replace with new. Pry out "O" ring and back-up (K) from head (E) and replace with new. Replace "O" ring (L). Remove wiper seal (N) from head cap (B).

7. Insert piston rod assembly into cylinder tube being careful not to damage T-seal (J). Slide head (E) with new "O" ring (L) and "O" ring with back-up (K) into tube and onto rod far enough to install retainer ring (F). Install retainer ring.

8. Pull piston rod assembly out and against head (E) to force head against retainer ring. Slip head cap (B) onto rod and into tube. Line up holes, insert bolts (A) and tighten. Install new wiper seal (N).

9. Reinstall cylinder on machine. Connect hoses. Purge air from cylinder by actuating cylinder under power. Replace lost oil.

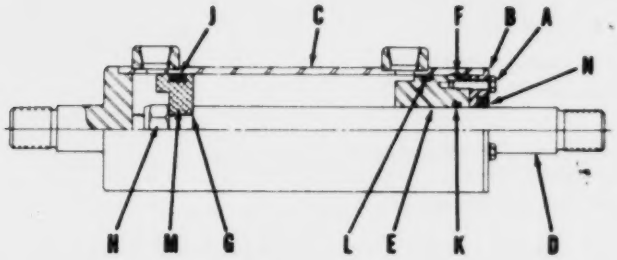


FIGURE 18

INSTALLING THE COMPANION FLANGE (Fig. 19) OR END YOKE (Fig. 20) ON THE TAPERED SHAFT OF "SUNDSTRAND" HYDROSTATIC PUMP.

The companion flange or end yoke is assembled onto the tapered pump shaft with a woodruff key, slotted nut and cotter pin.

A minimum torque must be applied to the slotted nut to prevent movement of either the companion flange or end yoke on the pump shaft.

Clean pump shaft and companion flange or end yoke with a solvent. Remove any burrs from key or keyways that may be present.

Assemble companion flange or end yoke on pump shaft making certain key is lined up with keyway. Use a short brass rod or lead mallet to lightly tap the flange or yoke end on pump shaft so the tapered mating surfaces are in contact before applying torque to the slotted nut.

Thread on slotted nut. Torque nut to the following ft. lbs. minimum, then insert cotter pin. Do not back off on slotted nut to attempt to insert cotter.

"22" and "23" series pump: Dry threads – 230 ft. lbs.
Oiled threads – 185 ft. lbs.

Apply a coating of oil or grease to the splines of the yoke shaft. Grease fittings on journals.

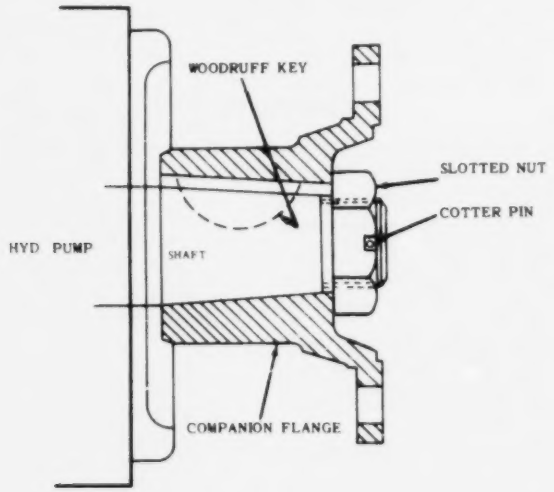


FIGURE 19

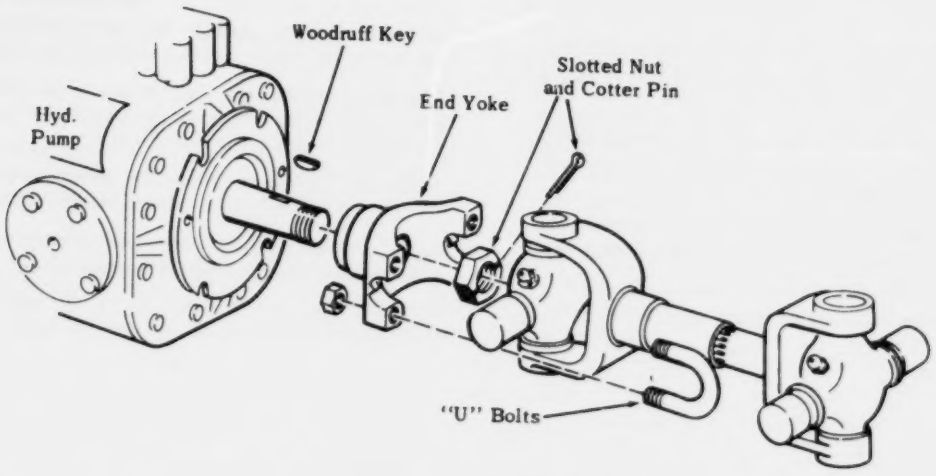

Woodruff Key
Slotted Nut
and Cotter Pin
End Yoke
Hyd.
Pump
"U" Bolts

FIGURE 20

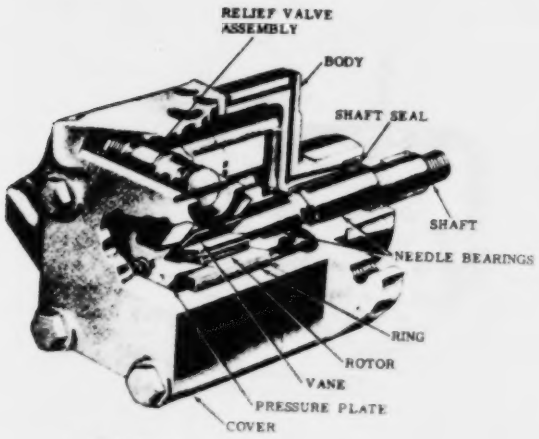


FIGURE 21

VTM42 STEERING PUMP

The assembly and construction of the VTM42 steering pump is illustrated in cutaway Fig. 21. The unit consists of the body, cover, ring, rotor, vanes, pressure plate, relief valve, and drive shaft assembly.

The pump is equipped with integral flow control and relief valves. Volume greater than the rated flow is by-passed to the inlet, within the pump through action of the flow control valve which operates on a pressure differential. The relief valve limits the maximum pressure in the hydraulic circuit.

It is important that the hydraulic pump drive belt be maintained tight to prevent slipping to maintain maximum output of pump. The pump bracket is provided with slotted holes by which the pump may be moved upward to tighten the drive belt.

Operation – Reference Fig. 21, the rotor is driven within the cartridge by a drive shaft, coupled to a power source. As the rotor speed increases, centrifugal action causes the vanes to follow the cam-shaped contour of the pump ring (Fig. 22). System pressure fed behind the vanes assures sealing contact of the vanes on the ring cam contour during normal operation.

The ring is shaped so that two opposing pumping chambers are formed, thus cancelling any hydraulic loads on the bearings. Radial movement of the vanes, and rotation of the rotor, causes the chamber area between vanes to increase in size at the inlet (large diameter) section of the ring. This results in a low pressure, or vacuum in the chamber. This pressure differential causes oil to flow into the inlet, where it is trapped between the rotating vanes and is forced, through porting in the pressure plate to discharge into the system as the chamber size decreases at the pressure (small diameter) section of the ring.

The flow of oil developed by pump operation is controlled by the integral flow control and relief valve.

NOTE: Relief valve – an integral relief valve in the unit protects the pump and other units in the hydraulic system from excessive pressures. Relief valve adjustment – the relief valve is pre-set at the factory and no field adjustment should be made. If the relief valve setting must be changed, a replacement valve should be installed.

The flow control valve functions to bypass excess oil into a return circuit through an internal passage in the pump cover. The bypassed oil is directed into the pump inlet. The high velocity of this oil accelerates flow from the tank. This combination produces a supercharge at the inlet of the pump.

When excessive pressure develops in the hydraulic system, the relief valve unseats, causing the flow control valve to open and bypass the entire pump output. This limits maximum pressure in the system to the relief valve setting and protects circuit components. A portion of the oil bypassed under pressure relief conditions is returned to the reservoir to improve heat dissipation.

Normally, the pump requires no manual priming. However, it is essential that, after starting a minimum drive speed of 400 r.p.m. be held until the pump picks up its prime and pressure is built up in the system. Failure to observe the above precaution can result in scoring and possible seizure of the pump due to a lack of oil for lubrication.

CAUTION: Do not use hydraulic brake fluid. Use only the recommended oil.

For Trouble Chart refer to chart on page 26.

VTM42 PUMP OVERHAUL

A. DISASSEMBLY – Before removing pump ¬ be sure it is not under pressure.

1. A puller must be used to remove pulley from shaft, otherwise bearing and shaft damage may result.

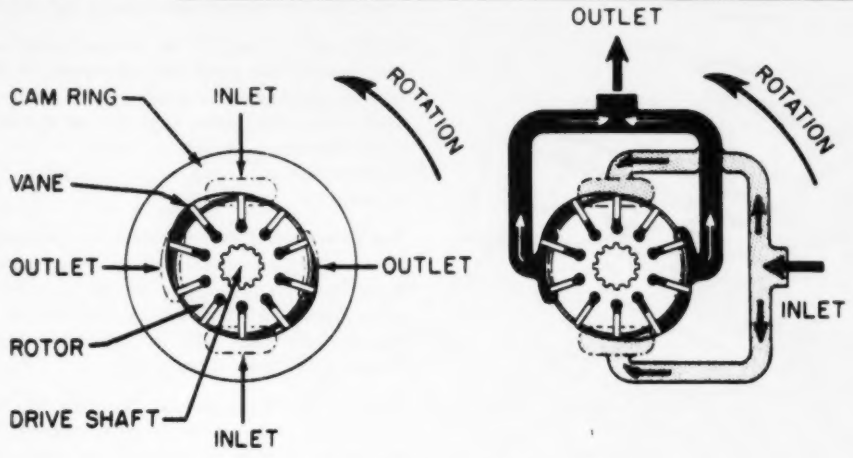
   During disassembly, special attention should be given to identification of parts for proper reassembly.

   Clean all parts except "O" ring seals in a clean mineral solvent. After drying thoroughly, lay the parts on a clean, lint free surface. All internal oil passages of the pump cover, housing and body must be thoroughly cleaned.

   CAUTION: Never use an air hose on or near the exposed parts because of the presence of water and dirt in the air system.

   All "O" rings, and the shaft seal should be replaced at reassembly. All seals should be soaked in hydraulic fluid before being used. Refer Fig. 23 and proceed with disassembly.

VTM42 Steering Pump, Cont'd:



SCHEMATIC VIEW
SHOWING OIL FLOW AND VICKERS HYDRAULIC BALANCE CONSTRUCTION

FIGURE 22

a. Cover end – Manifold – Remove screws, copper washer, manifold and "O" rings from pump cover. Remove cover mounting cap screws. Separate the cover from the pump body. Remove the pressure plate spring, pressure plate, pump ring, locating pins, rotor and vanes. Remove the two "O" rings.

b. Shaft end – Support the shaft end of the pump body in a 2" straight pipe coupling and, using an arbor press, remove the shaft thrust spacers, outer needle bearing and shaft seal. The shaft assembly should drop through a slot in the press table so the shaft will not be damaged. The outer needle bearing and shaft seal are a press-fit to the body. Use a pin punch and hammer to tap the inner needle bearing from the body.

c. Cover – Mount the cover in a vise. Drive out retaining pin with a pin punch. Protect the relief valve plug and subassembly against falling from bore. Work the plug, control valve and spring from the bore.

NOTE: Access to the relief valve plug and subassembly may be gained through the large chamfered hole which leads to relief valve bore from inside the cover.

Wash all parts in clean solvent. Inspect relief valve and bore for wear and scoring.

B. INSPECTION, REPAIR, REPLACEMENT

a. Ring, rotor, vanes, pressure plate and body. – Inspect the surfaces of all parts which are subject to wear. Light scoring may be removed from the faces of the body or wear plate with crocus cloth (by placing cloth on a flat surface), medium India stone or by lapping. Check edges of vanes for wear. Vanes must not have excessive play in slots or burrs on edges. Replace if necessary. Check each rotor slot for sticky vanes or wear. Vanes should drop in rotor slots by their own weight when both slot and vane are dry.

b. Relief valve – Insert valve in its bore in pump cover. There should be no binding. Check valves and bore for excessive wear and scoring. Replace if necessary.

c. Bearings – Wash bearings and shaft assembly thoroughly. Bearings must be replaced if they are removed for any reason.

d. Shaft and Seal – Replace the shaft seal at each overhaul to prevent oil leakage. Check the drive shaft oil seal diameter for wear and scoring. Do not install a new seal on a shaft which is worn or damaged at the oil seal diameter. Replace the shaft if worn. Stone and polish the sharp edges on the shaft to prevent damage to the seal.

e. Body and Cover – Stone all mating surfaces with a medium India stone to remove all burrs and sharp edges. Rewash all parts after stoning.

C. REASSEMBLY

1. Immerse all parts in clean hydraulic oil to facilitate reassembly. Refer Fig. 23

a. Shaft end – Press inner needle bearing in the body, using an arbor press.

b. Assemble the split-ring thrust spacer on the shouldered portion of the shaft in the body.

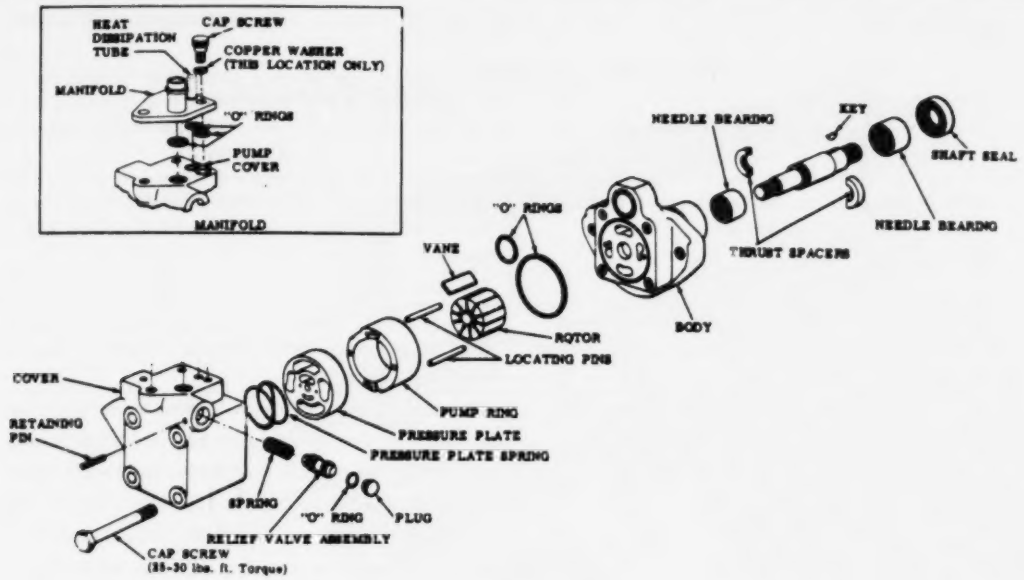


FIGURE 23

c. Press outer needle bearing onto shaft. The edge of the bearing must be $\frac{1}{64}$" below the shaft seal shoulder when assembled. This provides for shaft end play of approximately .010" to .15".

NOTE: Tools for installing bearings can be made from round stock, the outside diameter of which is slightly smaller than the outside diameter of the bearing and the inside diameter slightly larger than the shaft diameter. Do not score or otherwise damage the shaft during this operation.

d. Position the seal on the shaft end body, being careful not to damage seal. Press seal in until it engages the shoulder in the body. This shoulder acts as a positive stop for the seal. Do not overpress as damage to the seal will result.

e. Cover end – Install locating pins in pump body. Install ring over pins in correct direction of rotation.

Install rotor with chamfered edge of splined hole "in" or toward pump body. The chamfer facilitates assembly.

Install vanes with their radius edge toward the inner ring contour.

Oil the cartridge with clean hydraulic oil and install pressure plate.

Install "O" rings. Install pressure plate spring and cover. Tighten cover screws to 25-30 lbs. ft. torque.

Install pressure compensating spring in relief valve bore. Insert valve assembly with the hexagonal end toward the spring. Install plug with "O" ring in bore and hold it in position while driving a new retaining pin.

f. Manifold – Install "O" rings in pump cover and secure manifold to pump body with screws. Copper washer is used on screw where tapped hole enters oil passage.

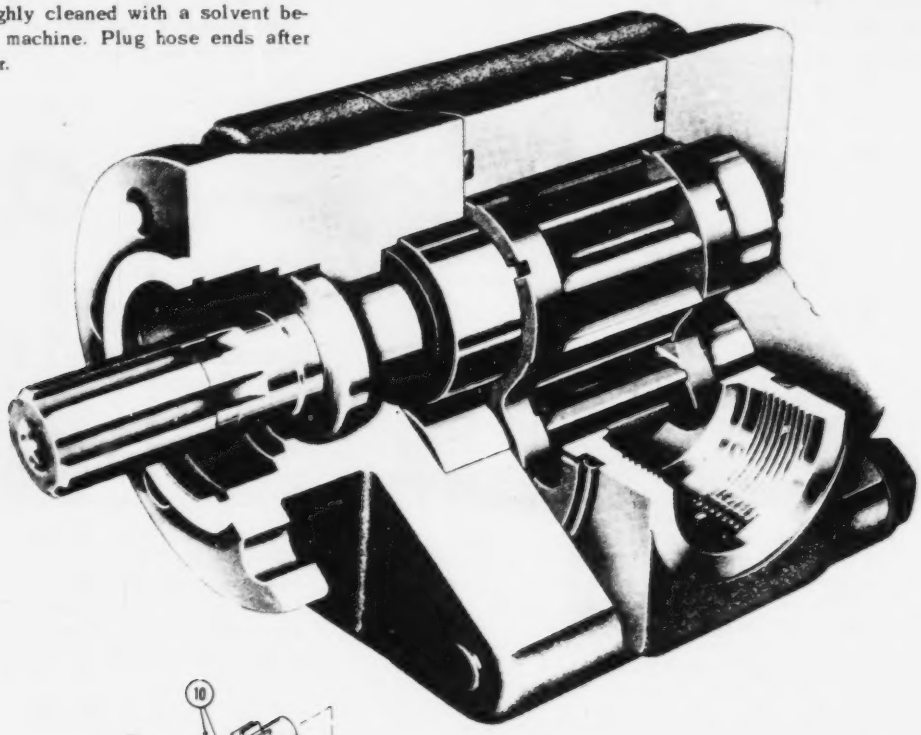
TROUBLE SHOOTING CHART

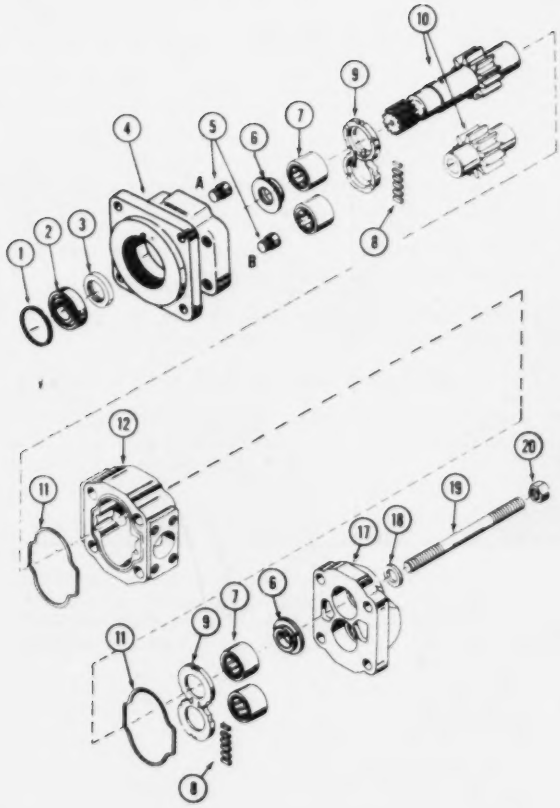
(VTM42 STEERING PUMP)

TROUBLE	PROBABLE CAUSE	REMEDY
Pump Not Delivering Oil.	Driven in wrong direction of rotation.	Check direction of pump shaft rotation. It should rotate clockwise as viewed from the coupling end of the unit.
		See also reassembly instructions for pump cartridge.
	Pump drive shaft disengaged or sheared.	Remove pump. Determine damage to cartridge parts (see disassembly instructions). Replace sheared shaft and needed parts.
	Flow control valve stuck open.	Disassemble pump and wash control valve in a clean solvent. Return valves to its bore and slide it back and forth. No stickiness in movement should occur. If a gritty feeling is noted on the valve O.D. it may be polished with a crocus cloth. Avoid removal of excess material or rounding of valve edges during this operation. Do not attempt to polish the valve bore. Wash all parts before reassembly of pump. Fill system with clean oil as recommended.
	Vane or Vanes stick in slots.	Disassemble pump. Examine rotor slots for dirt, grime or small metal chips. Clean rotor and vanes in a good grade solvent (mineral oil or kerosene). Reassemble parts and check for free vane movement.
	Oil viscosity too heavy to pick up prime.	Use fluid of the proper viscosity as recommended in oil data (Table).
Noisy Pump Operation.	Pump intake partially blocked.	Drain system completely. Flush to clear pump passages. Flush and refill system with clean oil as recommended.
	Air vent for oil tank clogged or dirty strainer.	Remove filler cap and clean air vent slot. Check strainer in tank for clogged condition. Drain, flush and add clean oil to system.
	Air being drawn into pump return connection.	Pump must receive air-free oil or pump will be noisy. Drain system. Tighten all hose connections. Clean or replace filter. Add clean oil as recommended.
	Leaky shaft seal.	Check pump shaft seal and replace if sealing lip has been damaged. Check for scoring of shaft at seal contact area. Replace faulty shaft.

HYDRAULIC (VIBRATOR) DRIVE MOTOR MODEL P51

Units should be thoroughly cleaned with a solvent before removing from the machine. Plug hose ends after disconnecting from motor.





Plug 5 in position B gives clockwise rotation.

Plug 5 in position A gives counterclockwise rotation.

Check valves in both positions give bi-directional rotation.

PARTS LIST

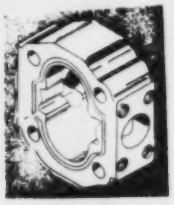
1. Snap Ring
2. Outboard Bearing
3. Seal
4. Shaft End Cover
5. Check Assemblies or Plug
6. Ring Seals
7. Roller Bearings
8. Pocket Seals
9. Thrust Plates
10. Integral Drive Shaft and Gear Set
11. Gasket Seals
12. Gear Housing
17. Port End Cover
18. Washers
19. Cap Screws
20. Nuts

GEAR HOUSINGS:
Wear in excess of .005" cut-out necessitates replacement of the gear housing.

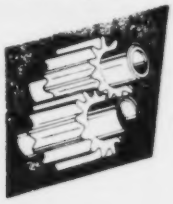
Place a straight-edge across bore. If you can slip a .005" feeler gauge under the straight-edge in the cut-out area, replace the gear housing.

Pressure pushes the gears against the housing on the low pressure side. As the hubs and bearings wear, the cut-out becomes more pronounced. Excessive cut-out in a short period of time indicates excessive pressure or oil contamination. If the relief valve settings are within prescribed limits, check for shock pressures or tampering. Withdraw oil sample and check it and tank for dirt.

Where cut-out is moderate, .005" or less, gear housing is in good condition, and both parts are of the same size, housing may be flopped over and reused.

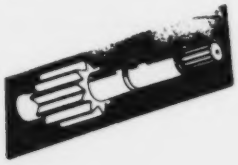


GEARS:
Any wear on gear hubs detectable by touch, or in excess of .002" necessitates replacement. Scoring, grooving, or burring of outside diameter of teeth requires replacement. Nicking, grooving, or fretting of teeth surfaces also necessitates replacement.



DRIVE SHAFTS:
Replace if there is any wear detectable by touch in the seal areas or at the drive coupling. .002" wear is the maximum allowable.

Wear in the shaft seal areas indicates oil contamination. Wear or damage to splines, keys, or keyways necessitates replacement.



BEARINGS:
If gears are replaced, bearings must be replaced. Bearings should fit into bore with a light press fit. A neat hand fit is allowable. If bearings can fall out, bore may be oversize.

SEALS AND GASKETS:
Replace all rubber and polymer seals whenever disassembling pump. Include all "O" rings, pocket seals behind thrust plates, shaft seal, and gasket seals.

CHECK VALVES:
Examine small check valves in shaft end cover to make sure they are intact and functioning. If there are no check valves here, make sure the high pressure side of the shaft end cover is plugged with an Allen plug.

THRUST PLATES:
The thrust plates seal the gear section at the sides of the gears. Wear here will allow internal slippage, that is, oil will bypass within the pump.

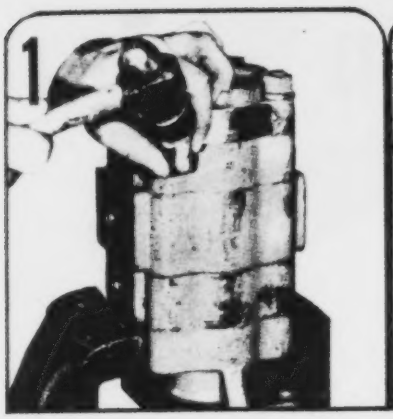
.002" maximum wear is allowable. Replace thrust plates if they are scored, eroded, or pitted.

Check center of thrust plate where the gears mesh. Erosion here indicates oil contamination.

Pitted thrust plates indicate cavitation or oil aeration.

Discolored thrust plates indicate overheating, probably insufficient oil.

DISASSEMBLY



Place the pump in a vise with the drive shaft pointing down. Caution: DO NOT GRIP ON OR NEAR ANY MACHINED SURFACES DURING ASSEMBLY OR DISASSEMBLY. Index mark all sections with a prick punch. Be sure to align these marks when re-assembling.

Remove the 4 cap screws or hex nuts and washers with a socket wrench.

Lift off the port end cover. If necessary to pry loose, be careful not to damage the machined surfaces. If the thrust plate remains in the gear housing, it can be tapped out later with a wooden hammer handle. Be careful not to distort the thrust plate.

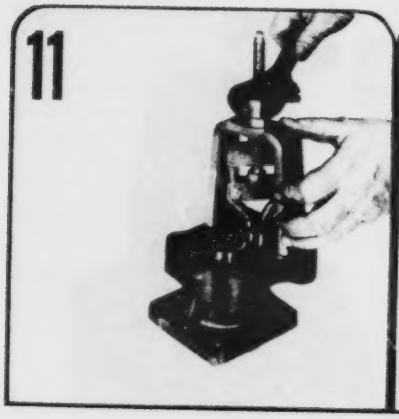
Lift or pry off the first section gear housing. Be careful not to damage machined surfaces. Remove thrust plate as described in step 3.

Remove the drive gear with shaft and the driven gear. Keep these together as they are a matched set. Examine and replace if necessary. See below*.

Take care not to damage the machined surfaces of gears.

Pry the thrust plate from the shaft end cover, port end cover, or bearing carrier with a screw driver or similar tool. Avoid distorting the thrust plate. Remove and discard all rubber pocket seals and gasket seals.

DISASSEMBLY, Cont'd.



Examine all roller bearings for scoring, spauling, or pitting. If replacement is necessary, pull the bearings with a bearing puller.

Check the ring seals for wear. Replace if necessary. To replace, pull the drive gear bearing with a bearing puller and remove ring seal from the bottom of bearing bore.

If the pump is equipped with an outboard bearing, place the shaft end cover in a vise with the mounting face up. Remove the bearing snap ring with a small screwdriver or awl.

If pump is equipped with an outboard bearing, it should be removed with a bearing puller.

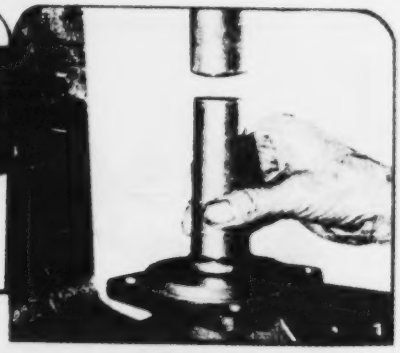
Grip the shaft end cover in a vise with the mounting face down. Remove double lip seal by inserting the special tool* into the notch between the double lip seal and the shaft end cover. Tap the seal out and discard.

Stone off all machined surfaces with a medium grit carborundum stone.

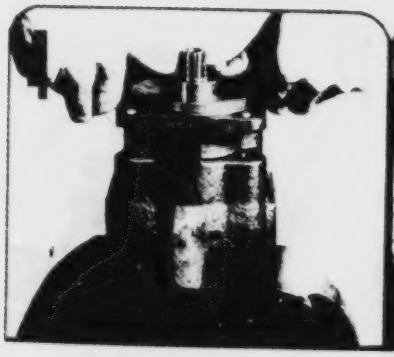
ASSEMBLY

If bearings have been removed, deburr bearing bores. Rinse parts in a solvent. Air blast all parts and wipe with a clean, lintless cloth before starting reassembly.

Grip the shaft end cover in the vise with the mounting face down. Examine the plug or 2 check valves, whichever is used, to be sure they are tightly in place. Replace only if parts are damaged or missing. ■ To replace a damaged plug, screw in the new plug until one thread of the hole is visible. Peen around the edge of the hole with a prick punch to secure. ■ Check valves can be removed with the special tool (see tool list). Screw in new valve with the tool until tight. Peen with a 1½" steel ball to secure.



Coat outside of double lip seal and its recess with purple Loctite Seal Retainer. With the metal side of the double lip seal up, press it into the mounting flange side of the shaft end cover with an arbor press and bar.* Make certain double lip seal is fully seated in the recess. Wipe off surplus Locktite.



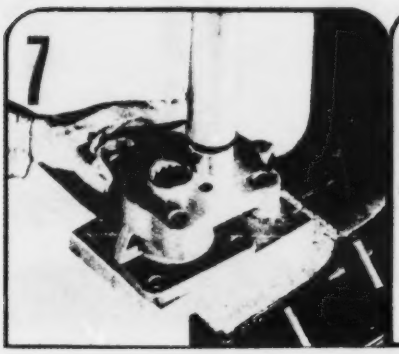
Omit this operation if the pump does not have an outboard bearing. If the pump is equipped with an outboard bearing, guide the bearing into its recess in the shaft end cover. This is NOT a press fit.

Insert the snap ring into its groove to retain the outboard bearing.

ASSEMBLY STEPS 6,7,8,9,10, AND 11 APPLY TO SHAFT END COVER, BEARING CARRIERS, AND PORT END COVER.

If ring seals are being replaced, insert into bottom of drive gear bearing bore. The notch in the ring seal MUST BE VISIBLE. This is a check to be certain the notched side is next to the bearing.

ASSEMBLY, Cont'd.



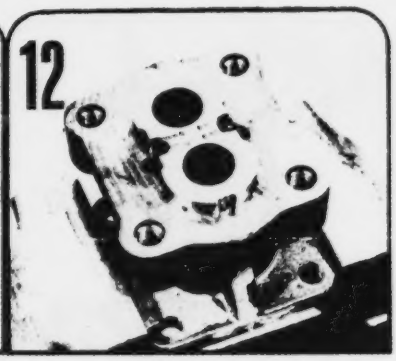
If any bearings have been removed from the shaft end cover, port end cover, or bearing carrier, replace the bearings by pressing them into the bearing bore with an arbor press.

Check all thrust plates for wear. Replace if necessary (see below).

Cut 2 pocket seals 7/32" long from the pocket seal strip. Grease these pocket seals and insert into the middle slots in the thrust plate.

With the pocket seals down, place the thrust plate over the bearings in the shaft end cover. Tap thrust plate with a soft hammer to about 1/32" from the machined surface.

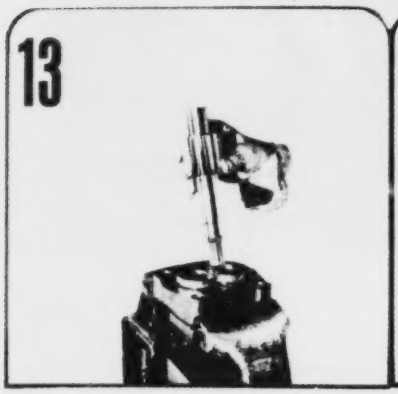
Cut 4 pocket seals approximately 1/4" long from the pocket seal strip. Insert one pocket seal into each of the slots in the thrust plate. Push each pocket seal all the way in so that they touch the roller bearings. Tap the thrust plate down firmly against the machined surface with a soft hammer. Use a sharp razor blade to trim exposed end of the pocket seal square and flush with the thrust plate.



Grip the shaft end cover in the vise with the mounting face down.

DO NOT GRIP ON OR NEAR ANY MACHINED SURFACES DURING ASSEMBLY OR DISASSEMBLY.

ASSEMBLY, Cont'd.



Lightly grease the drive shaft. Insert the integral gear and drive shaft with a twisting motion. Be careful not to damage the double lip seal. Push down carefully until gear rests against thrust plate. Insert the driven gear.

Grease the new gasket seals and insert them into the grooves in both sides of all gear housings.

Slide the first section gear housing over the gears and tap it with a soft hammer until it rests tightly against the shaft end cover. Be careful not to pinch the gasket seal. Squirt oil over the gears to provide initial lubrication when pump is started.

Place the port end cover over the gear journals and tap lightly against the gear housing. Be careful not to pinch the gasket seal.

Thread the 4 fasteners (cap screws and washers, or studs and nuts) into the shaft end cover and snug-up alternately or cross-corner. Rotate the drive shaft with a 6" wrench to make sure there is no binding in the pump.

After the fasteners are tight and you are sure there is no internal binding, torque the diagonally opposite fasteners to 200 ft. lbs. (2400 in. lb.)

PNEUMATIC ISOLATOR (TIRE AND WHEEL) REMOVAL FOR REPAIR OR CHANGE (Figures 21 thru 27)

The pneumatic isolators (tire and wheel) can be removed without removing the roller from the roller frame. For the purpose of describing the roller sides – the hydraulic motor side is the drive end and the opposite side is the driven end.

Repair should be made on a hard level surface. As a safety measure, wedge block the traction tires, front and back. Connect the steering lock link.

1. Figure 21. Remove the roller frame side covers at the drive and driven ends.
2. Figure 21. Place hydraulic jacks or blocking under the front and rear ends of the roller side frame being repaired, where indicated with arrows. Apply just enough upward pressure to keep the frame from lowering.
3. Deflate pneumatic isolator (tire) at opposite side being repaired to approximately 10 PSI (presuming the tire being repaired is already deflated). This is to acquire as much end play as possible to accomplish step 7.

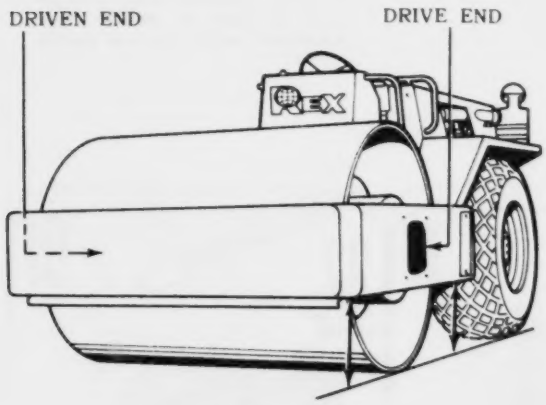


FIGURE 21

4. Figures 22 and 23. Drive End. Remove the hose clamp holding the two high pressure hoses in place. Loosen slightly (but do not remove the two hydraulic elbow fittings (3) threaded into motor). Remove four cap screws (4) holding the motor to the motor and wheel mount. Pull and swing out the motor from mounting frame.
5. Figure 23. Remove two cap screws (6), one each side, holding isolator cover half to roller frame. Remove four cap screws (7), two each side, holding the upper and lower cover halves together, then remove upper cover half.
6. Refer figure 22. Remove six cap screws (5) holding the wheel to the wheel mount.

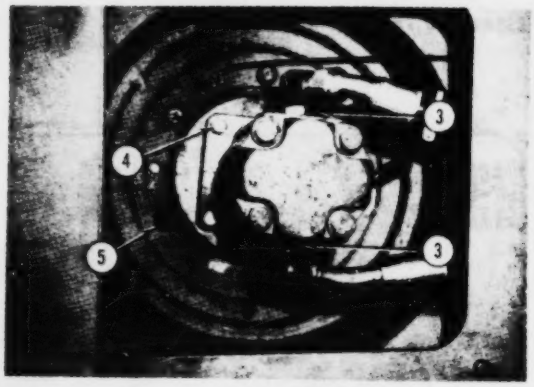


FIGURE 22

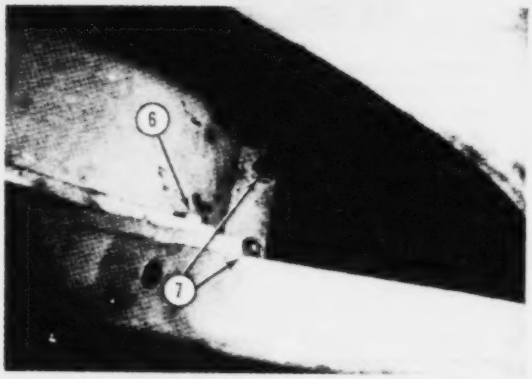


FIGURE 23

7. Figure 26. Using a sizeable pry bar, place pry bar between roller frame and edge of roller on the side being repaired and pry to force the roller frame away from the roller as far as possible. This will permit more clearance to remove the isolator.
8. Manipulate the isolator up and out from the roller frame. NOTE: The tire is keywayed to fit the key welded to the upper isolator half. In reassembly the keyway in tire must line up and fit the key in isolator.
9. Repair or change tire in the conventional manner.
10. Clean and inspect the interior of the isolator halves. After inspection, should the non-slip material be loose or damaged, it should be replaced with new. Interior surfaces must be cleaned with a solvent and dry before application of new non-slip material.
11. Assembly is in reverse of above. Add hydraulic oil to reservoir as a result of oil lost at loose motor connections.

Driven End – Figure 24 and reference figure 21.

12. Follow steps 1 thru 3.

13. Figure 24. Back off on lock nut holding magnetic pick-up (8) into the bearing housing. Unthread magnetic pick-up out of bearing housing and tuck into roller frame. If machine is not equipped with an amplitude indicator, proceed with step 15.

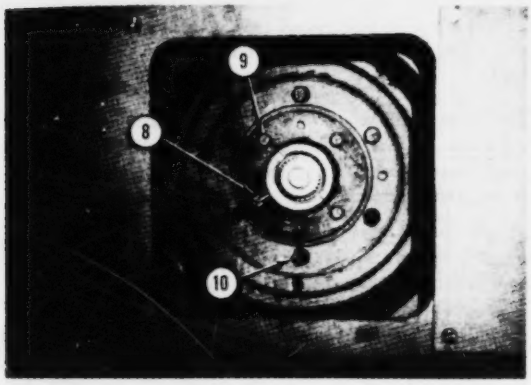


FIGURE 24

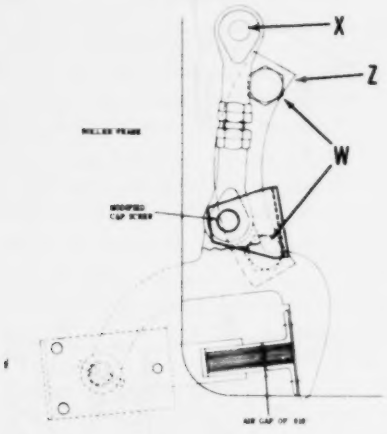


FIGURE 25

14. Figure 25. If machine is equipped with an amplitude indicator, remove top pin (X) and drop mechanism into roller frame. Remove two wheel bolts (W) and remove bracket (Z).

15. Figure 24. Remove four bolts (9) holding bearing flange to wheel mount and remove flange. Remove remaining wheel bolts (10).

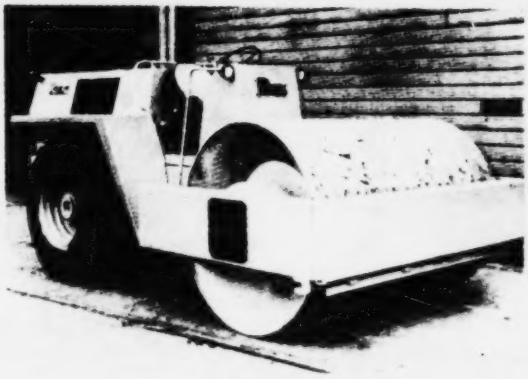


FIGURE 26

16. Follow step 5 and reference figure 23.

17. Follow steps 7 thru 11.

18. Figure 27. In reassembly of the magnetic pick-up to the gear (DD), the pick-up must be adjusted to have an air gap of 0.30, then secure with lock nut. Inflate tires to 25-28 PSI SP848. Check tire pressure weekly thereafter.

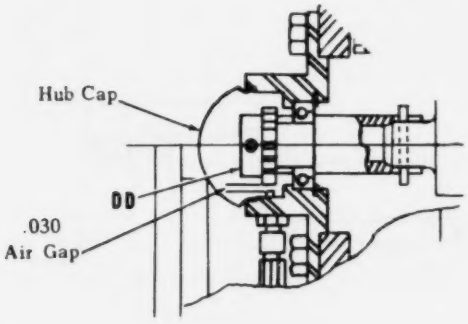


FIGURE 27

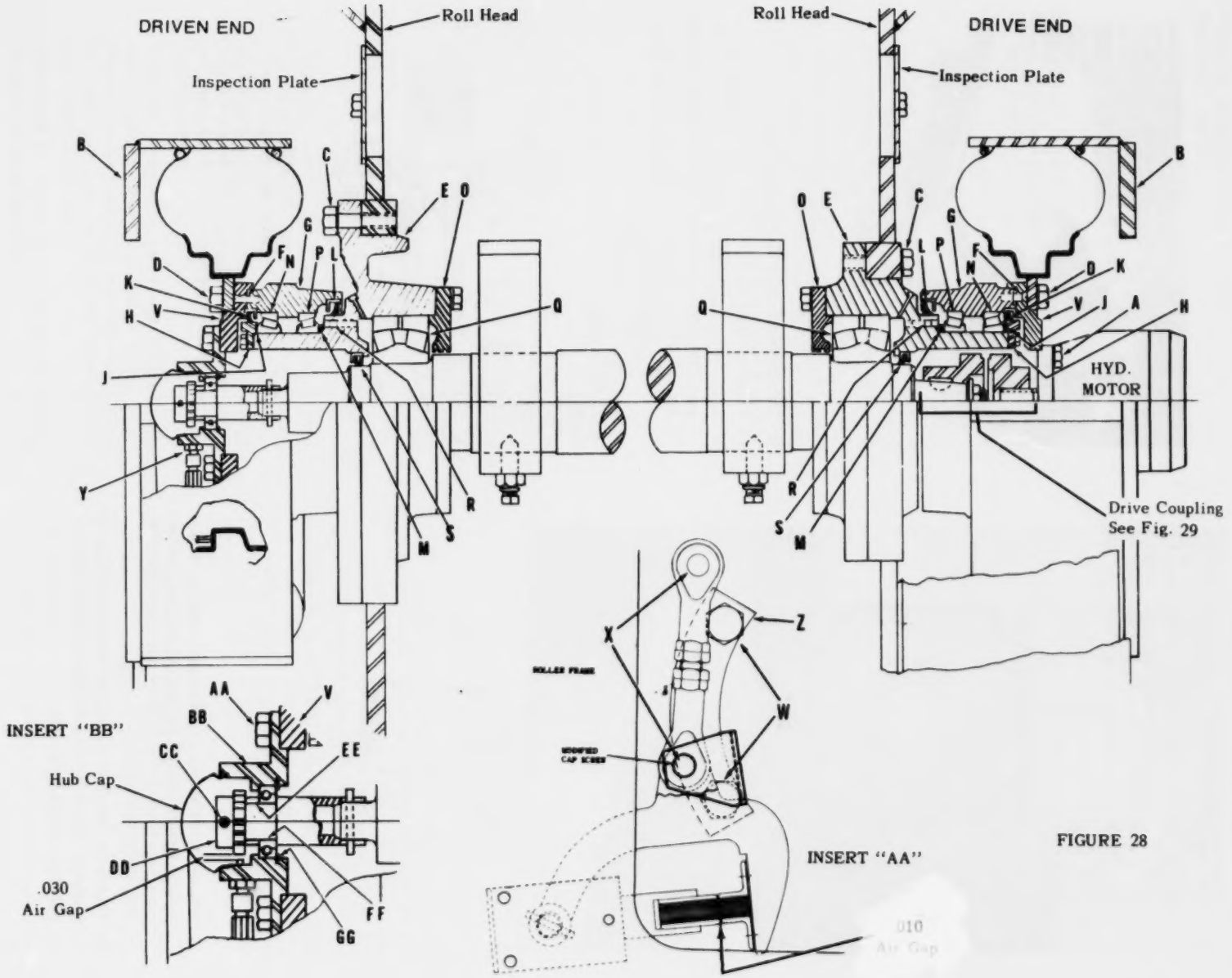

DRIVEN END
Roll Head
Inspection Plate
DRIVE END
Roll Head
Inspection Plate
HYD. MOTOR
Drive Coupling See Fig. 29
INSERT "BB"
Hub Cap
.030 Air Gap
INSERT "AA"
.010 Air Gap

FIGURE 28

A. ROLLER AND ISOLATOR (TIRE) REMOVAL FOR ACCESS TO VIBRATOR SHAFT BEARINGS AND SEALS (Fig. 28). ALSO REFER FOLLOWING "STEP B".

The roller should be in a machine shop or garage on a hard level surface. Wedge block the traction wheels as a safety precaution. Connect the steering lock link.

1. Place blocking, each side, between bottom of roll frame and floor to retain roll frame from falling when roll is disconnected and moved away from roll frame.

2. Remove roll frame side covers, each side.

3. Remove four bolts, two each side, from inside ends of front frame holding front frame to main frame. A fork lift or lifting device should support the front frame during removal. Move front frame out away from roll.

4. Hydraulic Motor Side – Clean hydraulic hose fittings and motor with solvent and blow air dry before proceeding. Disconnect hydraulic hoses from motor. Plug hose ends and hydraulic motor port holes to keep dirt from entering.

5. Remove four ½" x 1½" cap screws (A) holding motor to wheel and motor mount flange (V) and remove motor.

6. Four bolts hold the isolator halves (B) to the roll frame, two on top and two on the bottom. Remove these bolts. This will free the roll assembly from the main frame on this side.

7. Opposite Hydraulic Motor Side – Disconnect connector (Y) and fold cord back into roll frame. Refer to insert "AA", disconnect rod end linkage (X), then remove two bolts (W) and remove bracket (Z).

8. Four bolts hold the isolator halves (B) to the roll frame, two on top and two on the bottom. Remove these bolts. This will free roll assembly on this side.

9. Move roll assembly forward through frame opening.

10. If both side isolator housings (B) are to be removed, remove eight bolts, four each side, holding isolator housing halves together, exposing the pneumatic isolators.

11. Remove twelve bolts (D), six each side, holding wheel to wheel flange (V), and remove wheel and isolator. Isolators may now be repaired or replaced in the conventional manner.

12. In reassembly, inflate pneumatic isolators to approximately 5 p.s.i. Bolt wheel back on wheel flange. Bolt isolator halves together, then inflate and maintain isolators to 25 p.s.i. *See Note below

NOTE: The selection of the pneumatic isolators is the result of an extensive test program in order to attain maximum vibration isolation. It is therefore imperative that should replacement be necessary, the isolator be replaced by REX part numbers 298-6035-68 isolator and 298-6036-68 tube.

13. Remaining reassembly is in reverse of above. Add hydraulic oil to tank to level indicated. Run unit to purge air from system. Recheck oil level. Add oil if necessary.

*Clean interior of isolator halves before reassembly. When interior of isolator halves are cleaned and inspection indicates that the 3-M non-slip material is loose or damaged, it should be replaced with new. Metal surfaces should be cleaned with a solvent and dry before application of new material.

B. VIBRATOR SHAFT BEARING AND SEAL REPLACEMENT (Fig. 28)

To inspect, repair or replace the shaft bearings and seals the following disassembly procedure is recommended.

1. Remove roll from frame as outlined under "Pneumatic Isolator Removal."

2. With wheels (isolator rims) removed, next remove eight ¾" x 3" cap screws (C), each side, holding roll hub (E) to roll head.

3. Remove inspection plates, each side.

4. Remove lubrication hoses from each roll hub (E).

5. Insert four of cap screws (C) into the tapped holes in the driven hub (E) (DRIVEN END). Tighten bolts evenly. This will jack the entire vibrator shaft assembly out of roll toward driven end.

CAUTION and NOTE: During removal, support the drive end of shaft assembly thru inspection opening (drive end) in roll head. After removal, the shaft assembly can be placed on "horses" for ease of working.

Shaft Parts Disassembly, Drive End.
Drive Coupling – Removal and Reassembly. Ref. Figs. 28 and 29.

6. Remove outer internal snap ring (A), then slide out splined coupling half (B) with seal (C).

7. Remove nut and washer (D) from vibrator shaft.

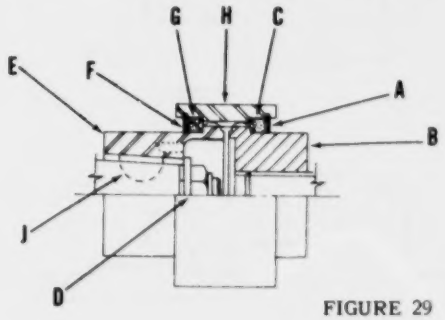


FIGURE 29

8. To remove the driven coupling half (E). A puller may easily be made from bar stock, figure 30, below or ordered from Rexnord per part number 102-8419-1.
Place puller in hub of coupling half (E), figure 31.. Insert two $\frac{5}{16}$ - 18 x 2½" long cap screws thru the $\frac{3}{8}$" dia. holes in puller and thread into tapped holes in coupling half. Thread the ½" - 13 x 3" sq. hd. cone point set screw into tapped hole of puller. Tighten down against shaft to remove coupling half. If necessary give a sharp blow to set screw to unseat coupling from tapered shaft. Remove puller from coupling half.

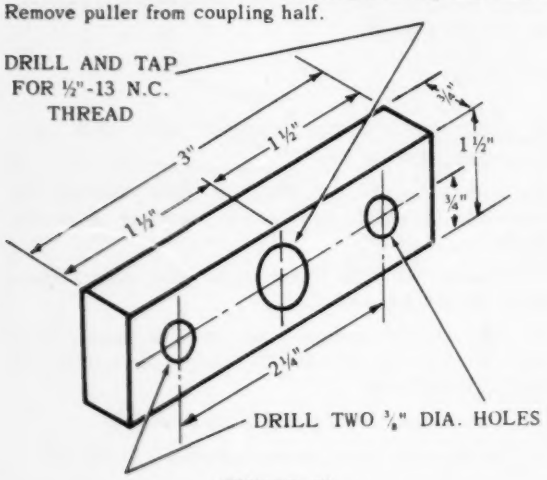


FIGURE 30

9. Remove snap ring (F) and seals (G) and (C).

Inspect all parts for wear and/or damage, especially the splines of coupling halves and sleeve (H). New seals should be used and soaked in oil before reassembly. If new coupling halves and sleeve are used make sure all parts are free of burrs. Proceed with Step 14 for further "drive end" disassembly. If not proceed with Step 10 to assemble coupling.

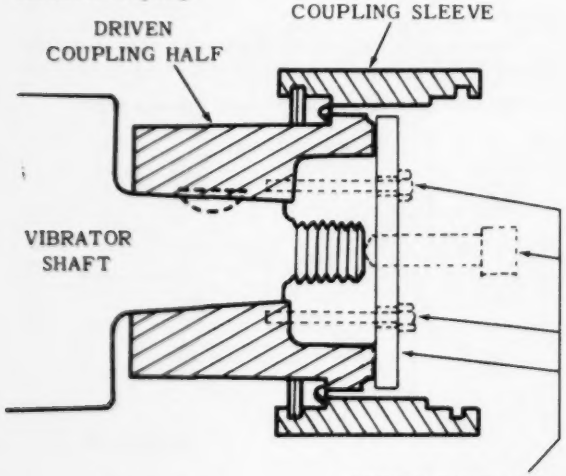


FIGURE 31

DRIVEN COUPLING HALF-PULLER ASSY.

10. In reassembly, install new seal (G) on driven coupling (E) first. Slip on coupling sleeve (H) and lock in place with snap ring (F). Install this assembly on shaft with key (J). Make sure coupling is seated properly on shaft. Tap coupling with wood block or brass rod with hammer if necessary to assure complete seating.

11. Install washer and nut (D)Torque nut to 250-275 ft. lbs

12. Hand pack this assembly with Mobilgrease 77 (or equivalent) before proceeding.

13. Install drive coupling (B) with new seal (C) into sleeve. Lock in place with snap ring (A).

NOTE: The drive coupling assembly must be hand packed with new and clean grease monthly. Refer to Lubrication Chart.

14. (Fig. 28), Remove four $\frac{3}{8}$" x 1" flat head machine screws (F) and remove wheel flange (V) from wheel hub (G).

15. Six $\frac{3}{8}$" x 1¼" cap screws with tab locks hold the bearing carrier ring (H) to roll hub (E). Flaten tab locks and remove cap screws to remove bearing carrier ring. Also remove shims immediately behind the bearing carrier ring.

16. Remove wheel hub (G) from roll hub (E). With the wheel hub, seals (L) and (K), cup of bearing (P) and bearing (N) will be free of roll hub (E). Pull cone of bearing (P) off roll hub and remove spacer (M).

17. Seals (L) and (K) may now be removed from wheel hub, and cones of bearings (P) and (N).

18. Remove eight ½" x 1½" self-locking cap screws holding labyrinth retainer (O) to roll hub (E).

19. The roll hub (E) contains three $\frac{3}{8}$" x 2" socket hd. dog pt. set screws (R). These are used to jack out bearing (Q) far enough so a puller can be used to remove bearing from the roll hub. Remove bearing. Return set screws into tapped holes. Remove seal (S).

20. Clean and inspect all parts. It is recommended new seals be used in reassembly. Soak seals in oil before assembly.

Driven End – Fig. 28 and Insert "BB"
21. Pry out hub cap. Remove four ½" x 1¼" self-locking cap screws (AA) holding bearing flange (BB) to wheel flange (V) and pull flange assembly off roll shaft. Drive out roll pin (CC) from gear (DD). Remove gear and spacer (EE). Pry out snap ring (GG) and press out bearing (FF) from flange.

22. From this point on, follow the preceeding steps thru 20. Procedure of disassembly is identical as to that for the "Drive End."

Assembly (Fig. 28) . Steps 23 thru 27 are identical for both sides.

23. Press seal (S) into roll hub (E). Lip of seal, when installed, must face toward bearing (Q).

24. Hand pack cavity in roll hub (E) with Shell Darina EP#2 grease, and hand pack bearing (Q) with same

grease. Press bearing (Q) into roll hub (E). Hand pack circular cavity of labyrinth retainer (O) with grease and install retainer on roll hub (E) with eight ½" x 1½" self-locking cap screws. IMPORTANT: Apply "Moly Spray Cote Lubricant M8800" to roll shaft bearing seat for bearing (Q). Reinstall roll hub with bearing on roll shaft.

25. Press cups of bearings (P) and (N) into wheel hub (G). Press seal (L) into wheel hub (G). Lip of seal to face toward bearings (P) and (N). Pack cavity in wheel hub between seal (L) and cup with grease.

26. Slip spacer (M) on roll hub (E) and against shoulder. Hand pack cone of bearing (P) with grease and install cone on roll hub. Now install this assembly on roll hub (E). Fill void that will be between bearings (P) and (N) with grease. Hand pack cone of bearing (N) with grease and install cone on roll hub (E). Install seal (K) in wheel hub (G). Lip of seal to face outward. Bolt bearing retainer (H), WITHOUT SHIMS (J), to wheel hub. Now check rolling torque of wheel hub with a torque wrench or torque scale. Torque should be between 10 and 15 ft. lbs. Use shims (J) as required to gain this torque. Bend tab locks over against hex of cap screws. Install wheel flange (V) on wheel hub (G) with screws (F).

27. Return roll shaft assembly into roll heads. Line up holes and bolt securely. Torque bolts to 200 ft. lbs. Roll shaft must have 1/16" to 1/8" TOTAL END PLAY after assembly.

28. Drive End – Install drive coupling assembly. Follow previous steps 10 thru 13.

29. Driven End – Press bearing (FF) into bearing flange (BB). Lock in place with snap ring (GG). Assemble onto shaft. Follow with spacer (EE), gear (DD) and lock in position with roll pin (CC). Guide slots in shaft around roll pin in roll shaft. Bolt this assembly to wheel flange (V).

30. Replace isolators. Refer to "Pneumatic Isolator Removal and Reassembly." NOTE: In reassembly tire valves must be on the bottom of rim when assembled in frame.

31. After roll is returned to roll frame, reconnect cord (Y). Refer Insert "AA". Replace bracket (Z) with bolts (W) and reconnect rod end linkage (X).

32. Grease hub roll bearings before use with Shell Darina EP#2.

33. *IMPORTANT: Break-in Sequence for Shaft bearings.*

Run unit for 15-20 minutes at 1200 vibrations per minute, then increase vibrations to 1700 and run for 1 hour. Stop unit. Test heat of housing (G) with a commercial type thermometer by placing it upright on top of the housing. Housing heat should not go beyond 225°F. If heat goes above this temperature, or vibrator shaft slows or stops – Stop run-in procedure and allow housings to cool completely.

Again start unit and run for 2 hours at 1700 vibrations per minute. Again make a heat test. Slowing of the vibrator speed after a period of running is an indication of excessive heat being generated. If a rerun test is required, regrease both bearing housings before resumption of test. If excessive heat still persists, consult Engineering Dept., Milwaukee.

VIBRATION METER – TROUBLE SHOOTING

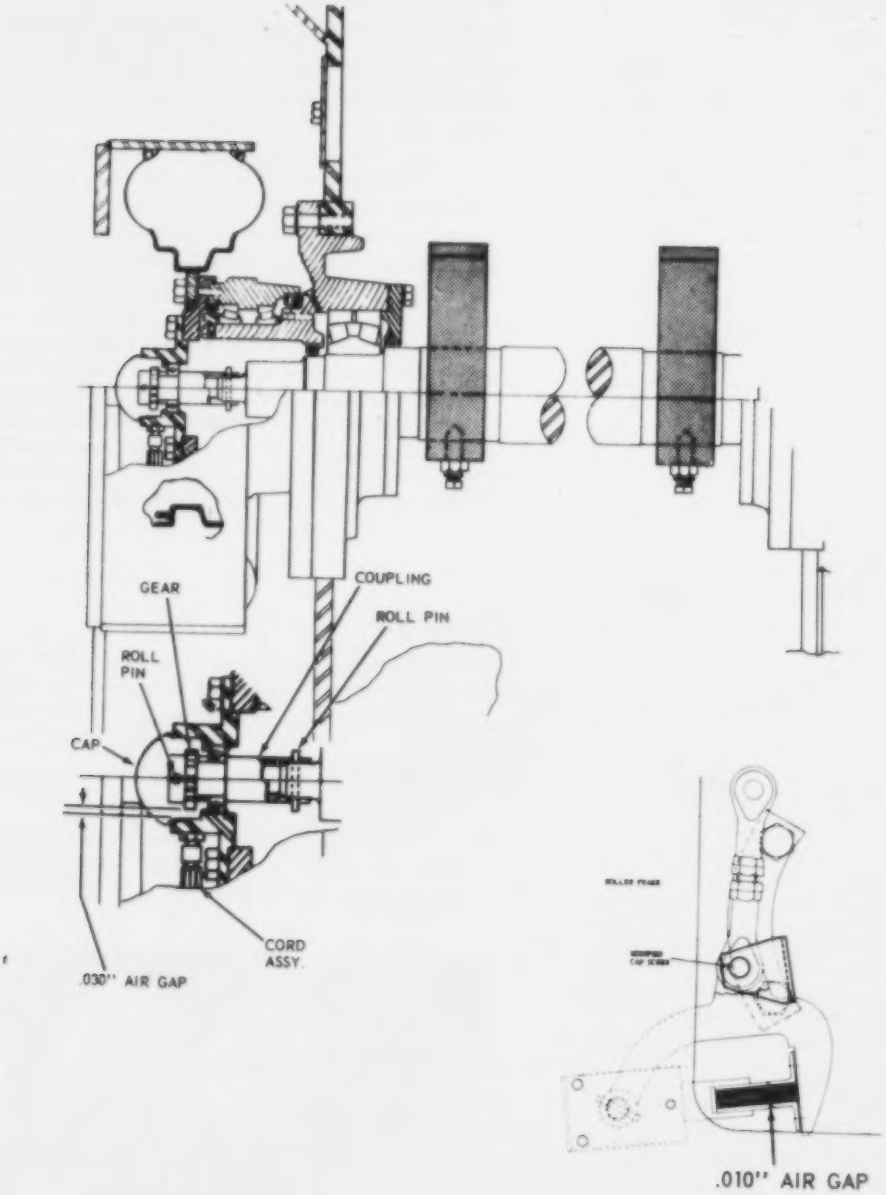
NOTE: Make all checks using ohmmeter and with ignition key in "off" position, except as noted.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Meter reads very low.	Core stack gap may be too wide.	Shim to adjust gap to .010".
	Primary ground connection may be bad.	Inspect and repair if connection is not good.
Meter does not operate.	Power supply may not be intact.	Check in control box for 12V DC across terminals H1 and H2. (Key "on" for this check.)
	Actuating arm or link may be damaged.	Inspect (at right end of roll) – repair or replace damaged parts.
	Wire cord may have internal break.	Check for continuity – replace entire cord assembly if continuity does not exist.
	Coil may be burned out. (At actuating arm)	Check primary winding (H1-H2) should read approximately 26 ohms. Check secondary winding (X1-X2) – should read approximately 1400 ohms. If either reading has very high resistance, coil is burned out and should be replaced.
	Rectifier may be burned out. (In control box)	Disconnect either terminal #7 or #8. Check resistance across 7 and 8. Then interchange probes and again check resistance. If both resistances are fairly close in value, rectifier needs replacing.
	Choke may be burned out.	Check across leads. If resistance is high, choke needs replacing. (Normal resistance is approximately 1 ohm.)
	Meter proper may be burned out.	Do not check with ohmmeter. If everything else checks out and meter needle does not deflect when turned "on", meter needs replacing.

FREQUENCY METER – TROUBLE SHOOTING

NOTE: Make all checks using ohmmeter. Engine should be "off" and ignition key should be "off", except as noted.

PROBLEM	POSSIBLE CAUSE	SOLUTION
Meter registers exceptionally low.	Line fuse may be blown.	Replace fuse in line under instrument panel (1 amp).
	Power wires may be disconnected.	Check and correct. (Key "on" for this check.)
	Meter assembly may not be working properly.	Replace meter assembly – not field repairable.
Meter does not register.	Line fuse may be blown.	Replace fuse – see above.
	Power wires may be disconnected.	Check and correct. Be sure red wire is properly grounded. (Key "on" for this check.)
	Coupling for magnetic pickup gear may be damaged.	Remove cover by prying. Try to rotate gear by hand. If gear rotates, coupling is damaged. Replace roll pin.
	Gap between magnetic pickup and gear may not be correct.	Adjust gap. Proper gap is .030". Tighten jam nut. Also clean any residue from around gear.
	Electric continuity between magnetic pickup and meter may be broken.	Under instrument panel, check across black and white wires from magnetic pickup, with ohmmeter probes. (Use needle probes or pointed objects to penetrate wire installation.) – A reading of approximately 100 ohms indicates continuity is good. – A reading of much higher than 100 ohms indicates an open circuit. If resistance reading indicates an open circuit, remove connector from magnetic pickup and shunt the two contacts in the connector with a short piece of wire. Again read the resistance across the black and white wires. – A reading of approximately 0 ohms indicates wire assembly is good, but magnetic pickup needs replacing. Replace pickup. – A reading of very high resistance indicates wire assembly has a break. Replace connector and cord assembly.
	Meter assembly may be damaged.	If system has checked out good to this point, problem is probably in the meter assembly. Install new meter assembly, as this is not field repairable.

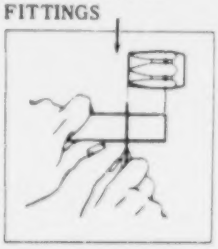

GEAR
COUPLING
ROLL PIN
ROLL PIN
CAP
CORD ASSY.
.030" AIR GAP
.010" AIR GAP

HIGH PRESSURE JOINER HOSE ASSEMBLY INSTRUCTIONS

AEROQUIP 2755-16 AND FC 136-16 HOSE AND FITTINGS

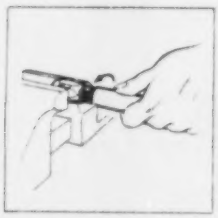
Step 1. Cut hose to length required. Hose must be stripped of its rubber cover before inserting in socket. Locate stripping point by putting hose end next to high pressure fitting as shown—from hose end of socket to notch on socket.

Step 1A. Strip hose. Cut rubber cover around down to wire reinforcement. Slit lengthwise. Raise flap and pull cover off, working clockwise around the hose (looking at end of hose). Clean excess rubber off hose, working with "lay" of wire to avoid fraying or unraveling.



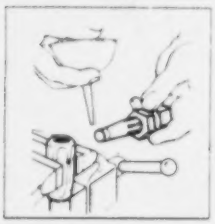
1

Step. 2. Put socket in vise. Fittings have annular grooved sockets—push while turning hose into socket with either a clockwise motion or an alternating motion of a quarter turn in each direction, **until it bottoms against shoulder of socket, then back off 1/4 turn.**



2

Step 3. Oil nipple threads and inside of hose liberally. No assembly mandrel is needed for spiral wrap hose. Use grease instead of oil for larger sizes.



3

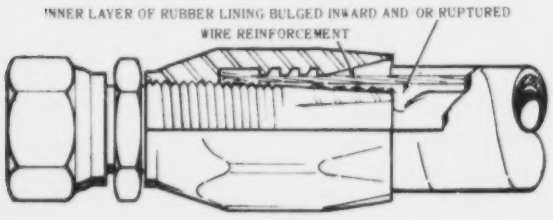
Step 4. Screw nipple clockwise into socket and hose. Leave 1/32" to 1/16" clearance for takeup.

4

Disassemble in reverse order

Below is a sketch of a hose that has been incorrectly assembled. The inner diameter layer of rubber has been ruptured, and in many cases the rubber is torn loose into shreds. This condition will cause hydraulic line leaking and eventual hydraulic system failure if not detected and corrected.

Inspect inside of hose fitting assembly for distortion of the inner diameter. Make sure no foreign material is left in the hose. Flush with oil and air blow dry before final line connection.



CLEAN HOSES AND FITTINGS

***CAUTION:** It is vitally important that no foreign material be introduced into the hydraulic system. Do not remove any plugs from lines, fittings or hydraulic pump or motor until ready to make connections. The following steps "a" and "b" must be complied with before making connections. Also, it is recommended that when making hose connections, the male threads be coated with a heavy oil.*

a. Fittings – All fittings, regardless if the ends are plugged or not, should be inspected for loose internal particles, thread burrs, etc. Burrs may be readily seen or felt and removed, however, dust and dirt may be present inside the fittings. Slush the fittings back and forth in a deep container of hydraulic oil. Blow dry with clean air.

b. Hoses – Check hoses and hose end fittings for burrs and dirt within the hose. Insert a wire of suitable length thru hose. Attach a piece of lint-free cloth of suitable thickness to the wire. Dip cloth in hydraulic oil and draw cloth thru the hose. Fill hose about 2/3 full of clean hydraulic fluid. Rock hose back and forth several times, empty fluid and blow dry with clean air.

CABLE CLIPS (Figure 25)

Cable clips are installed on the vibrator control cable and throttle control cable. The purpose of the clips is to provide a drag on the cables to hold the settings required.

The clips are tightened against the cable to a minimum amount to hold their stroke.

When a cable replacement is made and/or an adjustment becomes necessary, do not tighten clip down excessively. Use two clips if necessary.

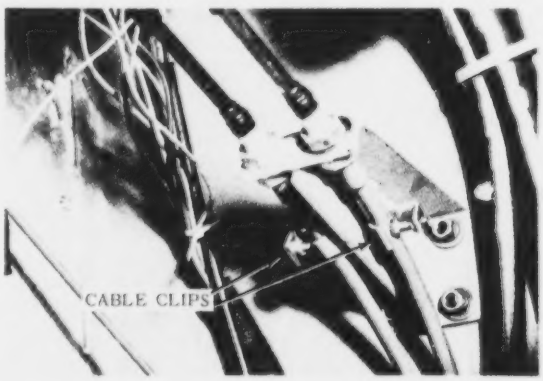


FIGURE 25

SUNDSTRAND (VARIABLE DISPLACEMENT HYDROSTATIC PUMP) AND (FIXED DISPLACEMENT HYDROSTATIC MOTOR), PAGES 49 THRU 68.

HYDRAULIC CIRCUITS

GENERAL

The hydrostatic transmission offers an infinite control of speed and direction. The operator has complete control of the system with one lever for speed and direction.

Control of the variable displacement, axial piston pump is the key to controlling the roller. Engine horsepower is transmitted to the pump. When the operator moves the control lever, the swashplate in the pump is tilted from neutral.

When the variable pump swashplate is tilted, a positive stroke to the pistons is created. This, in turn, at any given input speed, produces a certain flow of oil from the pump. This flow is transferred through high pressure lines to the motor. The ratio of the volume of flow from the pump to the displacement of the motor will determine the speed of the motor output shaft. Moving the control lever to the opposite side of neutral, the flow from the pump is reversed and the motor output shaft turns in the opposite direction. Speed of the output shaft is controlled by adjusting the displacement (flow) of the pump.

The pump and motor are contained in separate housings. All valves required for a closed loop circuit are included in either the pump or motor assemblies. A reservoir, filter, cooler and lines complete the circuit.

Figure 1 illustrates the internal components of a typical Sundstrand heavy duty hydrostatic transmission. Figure 2 illustrates the general appearance of the components of a heavy duty transmission.

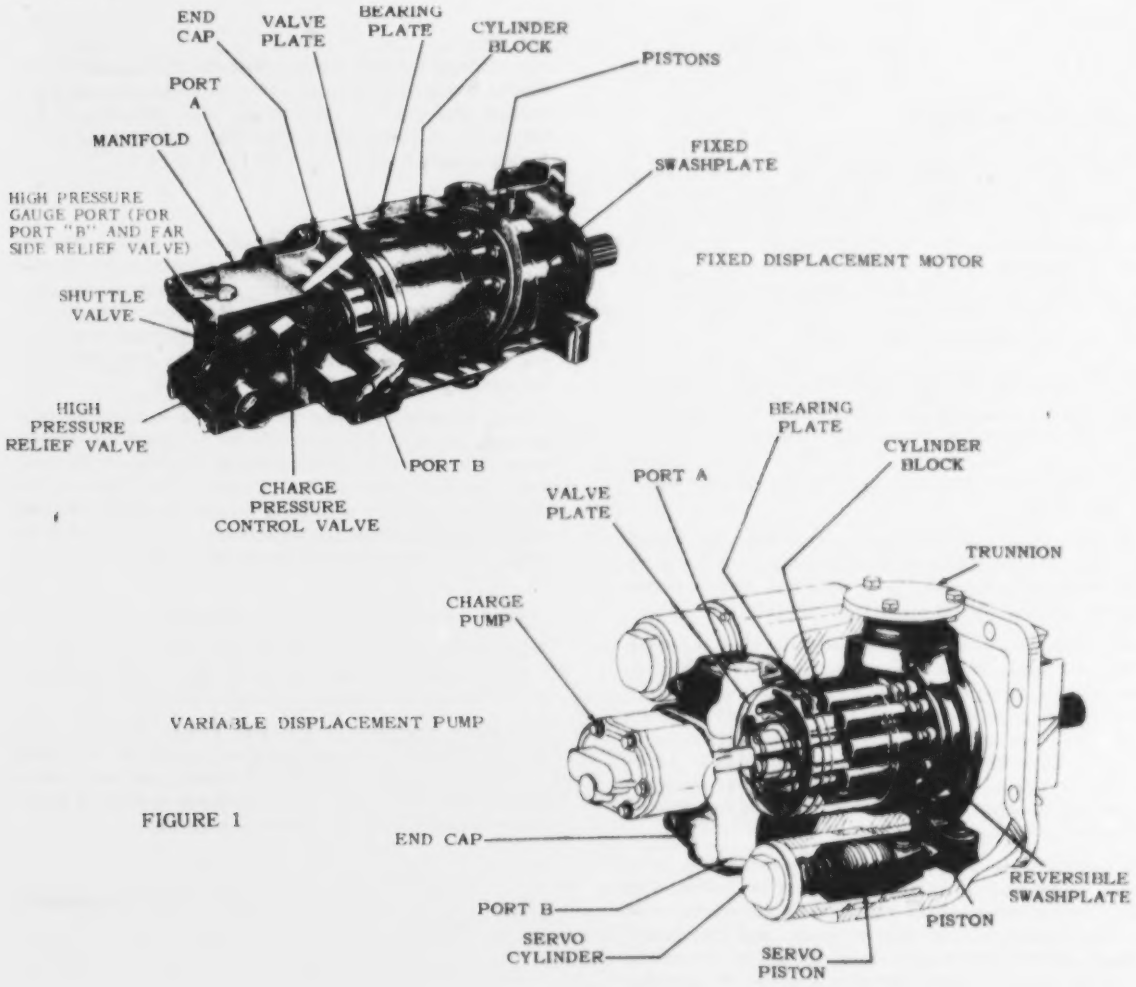
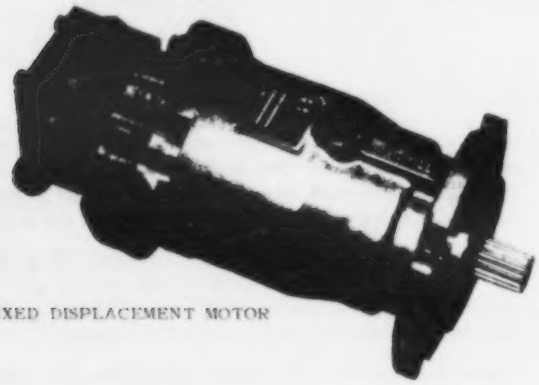
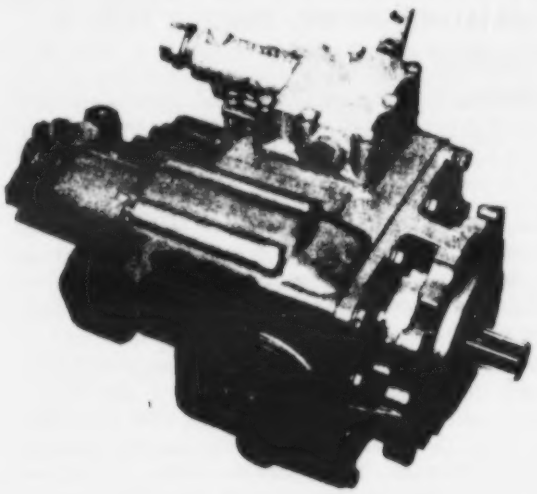


FIGURE 1



FIXED DISPLACEMENT MOTOR



VARIABLE DISPLACEMENT PUMP

FIGURE 2

CHARGE PUMP CIRCUIT

Fluid flows from the reservoir through a filter to the inlet of the charge pump mounted on the main pump which is driven at pump shaft speed. The purpose of the charge pump is to provide a flow of fluid through the transmission for cooling purposes, to supply fluid under pressure to maintain a positive pressure on the low pressure side of the main pump/motor circuit, to provide sufficient fluid under pressure for control purposes, and for internal leakage makeup.

MAIN PUMP AND MOTOR CIRCUIT

Fluid from the charge pump is directed to the low pressure side of the main circuit by means of one of two check valves. The second check valve is held closed by the fluid under high pressure on the other side of the main circuit.

Fluid flows in the main circuit in a continuous closed loop. The quantity of fluid flow is determined by pump speed and displacement while direction of flow is determined by the swashplate angle from neutral.

A manifold valve assembly, connected across the main circuit, includes elements essential to provide the proper operation of the transmission. The manifold valve contains two pilot operated high pressure relief valves which serve to prevent sustained abnormal pressure surges in either of the two main hydraulic lines by dumping fluid from the high pressure line to the low pressure line during rapid acceleration, abrupt braking and sudden application of load.

Also provided in the manifold valve assembly is a shuttle valve and a charge pressure relief valve. The shuttle valve functions to establish a circuit between the main line that is at low pressure, and the charge pressure relief valve to provide a method of controlling the charge pressure level and also a means of removing the excess cooling fluid added to the circuit by the charge pump. The shuttle valve is spring centered to a closed position so that during the transition of the reversing of pressures in the main lines, none of the high pressure fluid is lost from the circuit.

COOLING CIRCUIT

Excess cooling fluid from the manifold charge pressure relief valve enters the motor case, then flows through case drain lines to the pump case, through the pump case and heat exchanger to the reservoir. The heat exchanger by-pass valve is used to prevent high back pressure at the heat exchanger due to cold fluid or a restricted heat exchanger.

During periods of operation when the main pump is in neutral, the shuttle valve will be centered and the excess flow from the charge pump is directed to the cooling circuit by the neutral charge relief valve in the charge pump. When operating at this condition, cooling flow is not admitted to the motor case, but through the pump case and heat exchanger to the reservoir.

DISPLACEMENT CONTROL OPERATION

The Sundstrand Heavy Duty Variable Pumps incorporate a powered servo system to control the swashplate position with a correspondingly low operator effort.

The valve assembly is a closed center four-way valve with the servo pressure ports exhausted at the center position. The valve is operated through internal linkage connections with both the swashplate and the external control handle. Refer to figure 3, page 51.

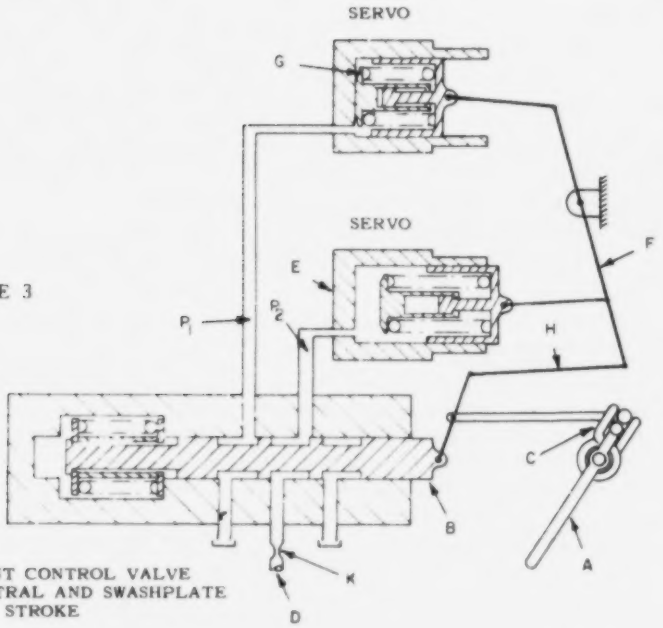
Cont'd. on page 51

To put the pump in stroke, the control handle (A) moves the displacement control spool (B) through a spring (C). The spool ports oil under charge pressure (D) to a servo cylinder (E). The piston moves the swashplate (F) against the opposite servo spring (G). Both servo springs are constrained so that they can only force the swashplate toward neutral. When the swashplate has moved to the angle set by the control handle, the feed-back link (H) returns the displacement control spool almost to neutral where it ports just enough oil to the servo cylinder to keep the swashplate at the proper angle.

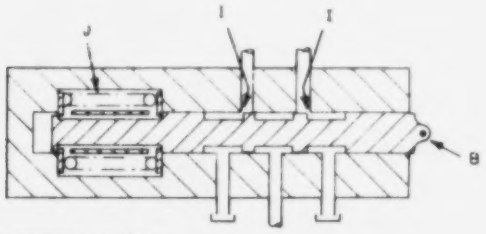
The orifice (K) restricts the incoming charge supply to limit the maximum servo response rate. Spring (C) allows the operator to rapidly preselect the desired speed setting without waiting for the swashplate to follow-up.

When the mixer control handle is moved to neutral position, the displacement control spool is returned to neutral by a spring (J). This allows oil from both servo cylinders to flow into the pump case through the small underlaps (I). (Refer to figure 4.) Both servo cylinders are thus exhausted and one of the servo springs (G) mechanically forces the swashplate to neutral.

FIGURE 3



DISPLACEMENT CONTROL VALVE
OUT OF NEUTRAL AND SWASHPLATE
MOVING INTO STROKE



DISPLACEMENT CONTROL VALVE
IN NEUTRAL

DISPLACEMENT CONTROL VALVE
FIGURE 4

TROUBLE SHOOTING PROCEDURE

Before Proceeding With Trouble Shooting, Read the Following Information!

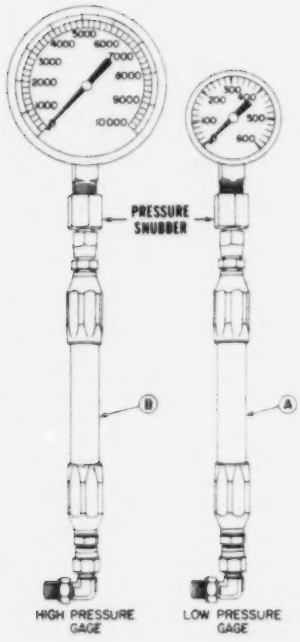
Sundstrand Heavy Duty transmissions must maintain various pressures to function properly. Any disturbance of the proper pressure levels will lead to an inoperable transmission.

1. CHARGE PRESSURE: The minimum allowable charge pressure is 130 p.s.i. Normal charge pressure is 160 p.s.i. and 190 p.s.i. when pump is in neutral.

2. SYSTEM OR HIGH PRESSURE: The maximum system pressure obtainable is controlled by the high pressure relief valves located in the motor manifold. The relief valves have a two (2) digit number stamped on the exposed end stating valve setting (i.e. "50" = 5000 psi). High pressure gauge port (Gauge "B", figure 11) monitors far side high pressure loop and near side relief valve.

The necessary gauges and complimentary equipment required are depicted in Figure 10. Their proper installation in the circuit is depicted in Figure 11.

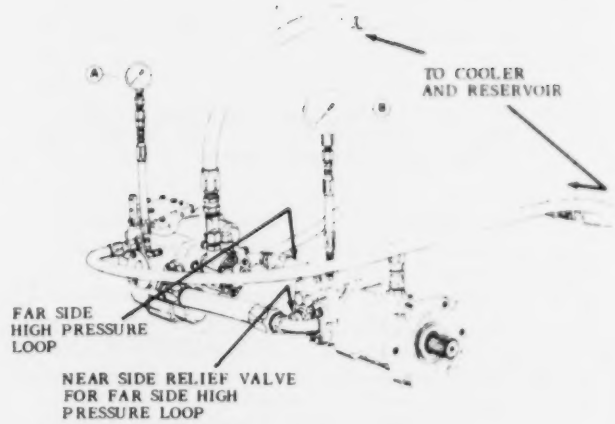
NOTE: For accurate gauge interpretation, it is recommended that the pump drive shaft be turning at or near maximum RPM.



TROUBLE SHOOTING GAUGES
Fig. 10

A. Gauge Connection = 7/16 x 20 SAE "O" Ring – All Series

B. Gauge Connection = 7/16 x 20 SAE "O" Ring – All Series



TYPICAL GAUGE INSTALLATION (PV-MF)
Fig. 11

SUNDSTRAND HYDROSTATIC
SERVICE BULLETIN
TROUBLE SHOOTING PROCEDURE

IMPORTANT PUMP AND MOTOR SERVICE NOTE: Always include pump or motor model and serial numbers along with the mixer serial number when ordering pumps, motors or service parts. (Do not open any part of the system without first cleaning the surrounding area.)

I. System* Will Not Operate in Either Direction.

*The word system denotes both pump and motor plus all lines, valves, filters, controls, etc., leading to and in between them.

Cause	Remedy
A. System Low on Oil.	1. Check oil level in reservoir and replenish, if necessary.
	2. Locate and fix leak or leaks causing the loss of oil.
B. Faulty Control Linkage to Pump.	1. Check the entire linkage to make sure it is connected and free to operate as it should.
C. Slump and/or Pump Dump Valve Stuck Open.	1. If used, make sure the Slump and/or Pump Dump Valve is closing properly. Check valve for leakage.
D. Disconnected Coupling.	1. Check to see that the coupling from the prime mover to the pump and the coupling from the motor shaft to the driven mechanism is not slipping or broken.
E. Low or Zero Charge Pressure (Steady).	1. Install pressure gauge (capable of 600 PSI) in either the ¼ N.P.T. in the charge pump or in the side of the main pump. NOTE: Charge pressure may also be taken by attaching a pressure gauge to the port on the rear of the motor manifold. This port, however, is blocked by the shuttle valve when the hydrostatic system is in neutral; therefore, the system must be operating either in the forward or reverse direction to obtain a pressure reading at this port.
	2. Set pump speed to at least 500 RPM. Charge pressure should read at least 120 PSI or more when main pump control lever is in pumping position and fluid motor is operating.
	3. Low charge pressure may be caused by: a. Charge pressure relief valve in charge pump stuck open or relief valve seat damaged. b. Charge pump drive shaft sheared. c. Suction line or filter blocked or clogged. d. Internal damage to pump or motor. e. "O" ring damaged or missing between displacement control valve and pump case page 66
F. Low and Fluctuating Charge Pressure.	1. Air in system. Air will also cause system to be noisy. Check all fittings, especially around filter, in the suction line and locate the point or points where air is being drawn into the system. Tighten fittings and joints where air leaks exist.

	2. Charge pressure relief valve in the motor manifold stuck open. Pressure will be normal when the pump is in neutral but low in stroke.
	3. Internal damage to pump or motor.
G. Faulty Check Valves.	1. Remove the two ball check valves located in the end cap of the pump under the charge pump and check the following: a. Check valve to see if poppet or ball is missing. b. Check to see if the valve seat is eroded. NOTE: If any of the above conditions exist, replace both check valves.
H. Internal Damage to Pump or Motor.	Indicated by: 1. Low or zero charge pressure (see I-E). Charge pressure may also fluctuate rapidly.
	2. Maximum obtainable operating pressure in both forward and reverse is less than the normal relief valve setting. Charge pressure, which will also be lower than normal, will drop to zero when the maximum pressure is reached.
	3. Pieces or flakes of brass in the reservoir and filter.
	4. Noisy unit (pump or motor). If either unit is considerably worn or damaged, the other unit should also be carefully checked.
I. Plugged Control Orifice	1. Remove displacement control valve from pump and inspect orifice and "O" rings.

II. System Operates in One Direction Only.

Cause	Remedy
A. Faulty Control Linkage.	1. Check the entire linkage to make sure it is connected and free to operate as it should.
	2. Make sure the control "stop," if used, is not out of adjustment.
B. High Pressure Relief Valve Stuck Open.	1. Switch the two high pressure relief valves. If the system operates in the direction in which it would not operate before, one of the high pressure relief valves is stuck open. Both relief valves should be examined and the stuck relief valve disassembled, cleaned, and then reassembled and both relief valves should then be reinstalled in the system.
C. One Check Valve Faulty.	Follow instructions given in I-G.
D. Faulty Directional Control Valve. (Located on Pump).	NOTE: Do not change the position of any of the hex nuts or the slotted plug on the end of the control unless it is necessary to remove the control valve spool. 1. Disconnect control linkage at directional control arm. Move the control arm back and forth by hand. If it moves freely with no resistance, even as little as 15°, the control valve should be removed and checked for broken parts or a bent control shaft to which the control arm is attached.
E. Displacement Control Valve "O" Ring Leaking	1. Remove displacement control valve from pump and inspect "O" rings.

III. Neutral Difficult or Impossible to Find.	
Cause	**Remedy**
A. Faulty Linkage.	1. Disconnect control linkage at directional control arm. If system now returns to neutral, the linkage to the control is out of adjustment or binding in some way.
B. Control Valve Out Of Adjustment. (Displacement control valve will not move out of adjustment on its own, it has to be done by human hands.)	1. See II-D NOTE.
	2. If the hex nuts and slotted plug have been moved out of adjustment, follow steps outlined on page 66.
C. Servo Cylinder Out of Adjustment.	1. Remove the two sleeve retainers.
	2. Return the servo cylinders to their original position. When the proper position of the servo cylinders was established at the factory, both the servo cylinder and the pump housing were marked with corresponding scribed lines. Matching these lines will return the cylinder to its original position and re-establish neutral.
	3. Reinstall the two sleeve retainers and restake, if necessary. NOTE: Servo cylinders do not move out of position on their own. If they get out of adjustment, it has to be done by human hands.
IV. System Operating Hot (TEMPERATURE GAUGE IN RED)	
Cause	**Remedy**
A. Oil Level Low.	1. Replenish oil supply.
B. Oil Cooler Clogged.	1. Clean cooler air passages.
C. Oil Cooler Being By-Passed.	1. Cooler by-pass valve, if used, stuck open.
D. Internal Leakage. (Usually accompanied by loss of acceleration and power and/or drum stops turning)	1. One of the high pressure relief valves may be stuck partially open. Install gauges and read the charge pressure and operating pressure in both directions. If the operating pressure is 200 PSI or more, lower than normal in one direction and normal in the other, switch the high pressure relief valves. If the low pressure also switches to the opposite side of the circuit, disassemble, check and clean the faulty (low) relief valve. Reinstall and recheck. Charge pressure should be normal at all times.
	2. Internal parts of pump or motor (or both) worn. Maximum obtainable operating pressure lower than the normal high pressure relief valve setting in both directions. When this pressure is reached, charge pressure will drop to or very near to zero. System will also be noisy at this point with the most noise issuing from the unit that is most worn. If either unit is considerably worn or damaged, the other unit should also be carefully checked. Replace the worn parts in the units affected or replace the complete unit.

V. System Noisy.	
Cause	Remedy
A. Air in System.	1. Low oil level in reservoir.
	2. Suction line between reservoir and charge pump, including suction filter, leaking at some point and allowing air to be drawn into system. A good indication of air in the system is a considerable amount of foam in the reservoir.
	3. End of return line within the reservoir not submerged in oil.
B. Hose or Tubing Not Properly Insulated.	1. Make sure hose or tubing is not touching any metal that can act as a sounding board for the neutral hydraulic hum.
	2. Insulate hose and tubing clamps with rubber to absorb noise.
VI. Acceleration and Deceleration Sluggish.	
Cause	Remedy.
A. Air in System.	1. See Step V-A.
B. Control Orifice Plug Partially Blocked.	1. Remove the bolts that hold the control housing in place and check the orifice. If this is clean, remove the charge pump and blow air through the passage between the charge pump and control.
C. Internal Wear or Damage.	1. See Step I-H.
VII. Oil Leak at Shaft End.	Remedy
	1. Replace seal. See instructions for "Pump" – See instructions for "Motor" –

TRANSMISSION REPAIR PROCEDURE

Should it become necessary to perform repairs to the transmission during the warranty period, certain parts, components or kits may be replaced without effecting or violating the Sundstrand warranty.

Repairs beyond those outlined under Field Repair will violate the warranty, therefore, it is recommended that the transmission be returned to the Sundstrand factory or an Authorized Sundstrand Service Station for repair or overhaul.

FIELD REPAIR

The following parts, components or kits may be replaced or repaired in the field without affecting or violating the Sundstrand Transmission Warranty:

1 REPLACEMENT OF MAIN PUMP

2 REPLACEMENT OF MOTOR

3 REPLACEMENT OF CHARGE PUMP

4 REPLACEMENT OF CHECK VALVES

5 REPLACEMENT OF MANIFOLD

6 REPLACEMENT OF HIGH PRESSURE RELIEF VALVES

7 REPLACEMENT OF DISPLACEMENT CONTROL

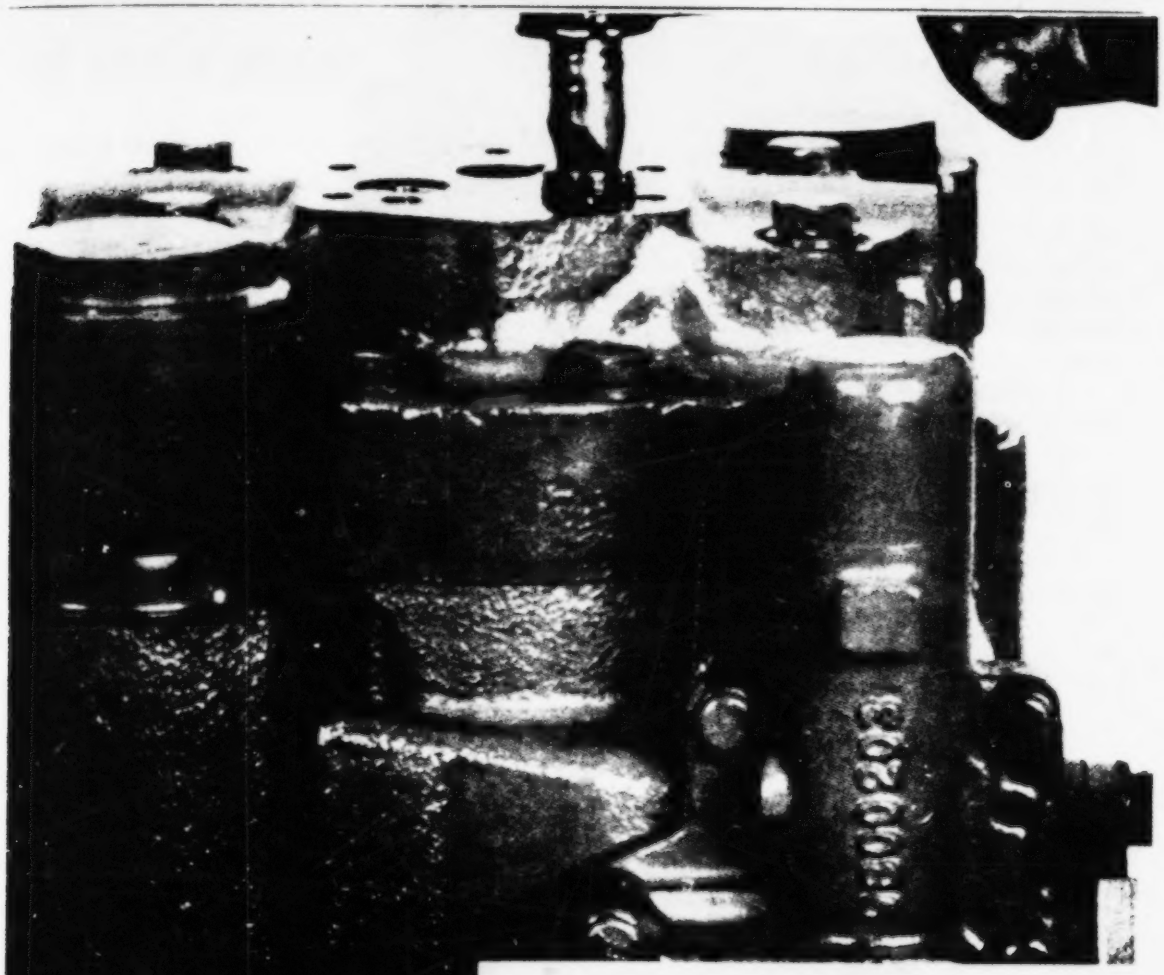
8 REPLACEMENT OF MOTOR OR PUMP FRONT SEAL

The proper replacement procedures for the above components are outlined on the following pages.

When working on all hydraulic equipment, cleanliness is very important. Before removing any of the above components, clean the immediate area to prevent dirt from entering the transmission.

Sundstrand Hydro-Transmission
division of Sundstrand Corporation
world's most complete family of hydrostatic transmissions and control systems

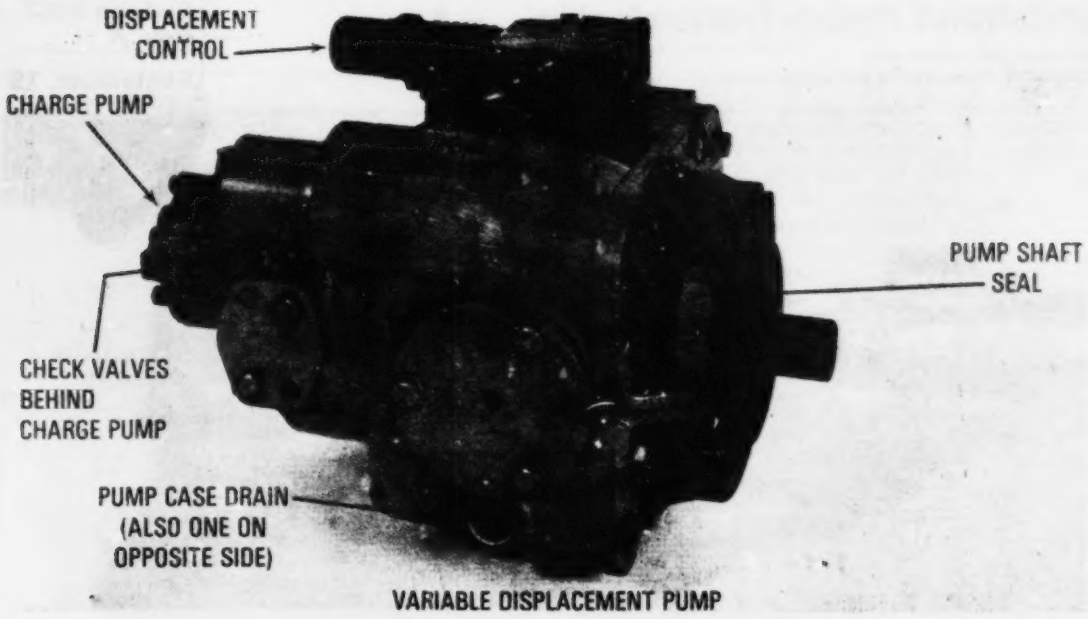
Bulletin 9482
Rev. A
September, 1971



replacement of major assemblies

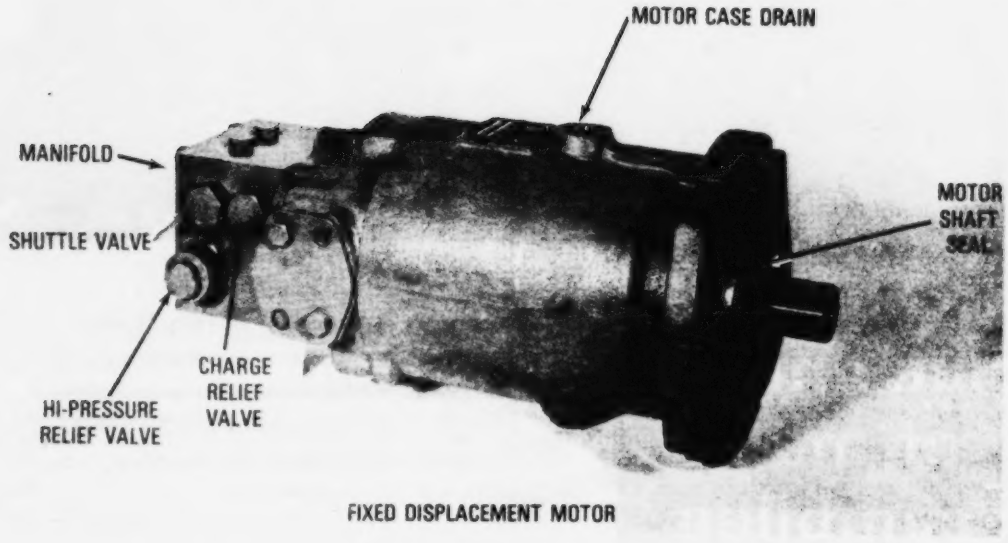
CONTENTS

SECTION 1 REPLACEMENT OF MAIN PUMP
SECTION 2 REPLACEMENT OF MOTOR
SECTION 3 REPLACEMENT OF CHARGE PUMP
SECTION 4 REPLACEMENT OF CHECK VALVES
SECTION 5 REPLACEMENT OF MANIFOLD
SECTION 6 REPLACEMENT OF HIGH PRESSURE RELIEF VALVES
SECTION 7 REPLACEMENT OF DISPLACEMENT CONTROL
SECTION 8 REPLACEMENT OF MOTOR OR PUMP FRONT SEAL


DISPLACEMENT CONTROL
CHARGE PUMP
PUMP SHAFT SEAL
CHECK VALVES BEHIND CHARGE PUMP
PUMP CASE DRAIN (ALSO ONE ON OPPOSITE SIDE)

VARIABLE DISPLACEMENT PUMP

FIG. A



FIXED DISPLACEMENT MOTOR

FIG. B

replacement of main pump

BULLETIN 9482
SECTION 1

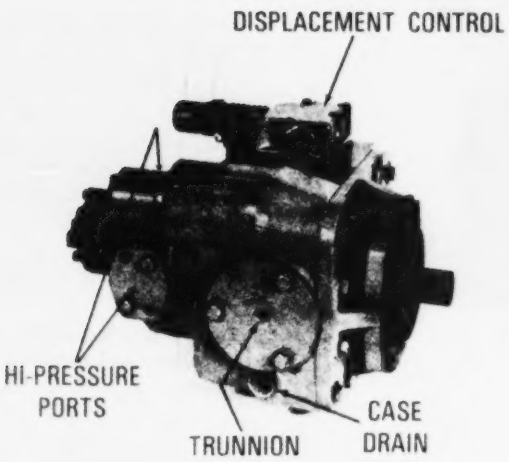


FIG. C

A. REMOVAL (See Figure C)

1. Remove control linkage from Displacement Control.

2. Loosen reservoir cap to relieve any system pressure.

3. Place drain pan or bucket under the pump.

4. Remove the five (5) hoses. Place clean plastic plugs in lines and pump ports to prevent oil loss as each line is removed. (Do not use rags).

5. Remove the four (4) mounting bolts.

6. Place a sling around pump or an eye bolt in the trunnion, remove pump from application.

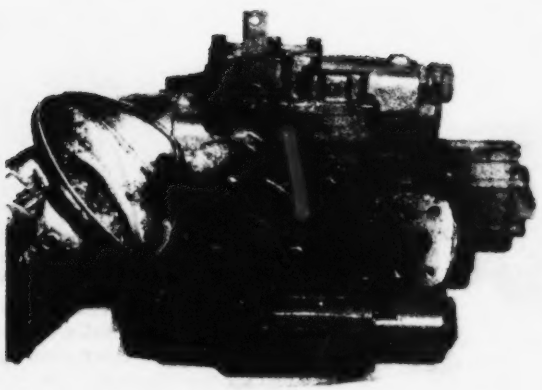


FIG. D

B. INSTALLATION

1. Mount pump on application using the four (4) mounting bolts.

2. Remove all shipping plugs as lines are installed. See plumbing diagram at rear of bulletin for correct line installation. Be sure lines are tightened to correct torques.

NOTE: *It is recommended the pump case be filled by hand to assure proper lubrication upon start-up. See Fig D.*

3. Install control linkage to Displacement Control. Consult owners manual for setting of neutral.

replacement of motor

BULLETIN 9482
SECTION 2

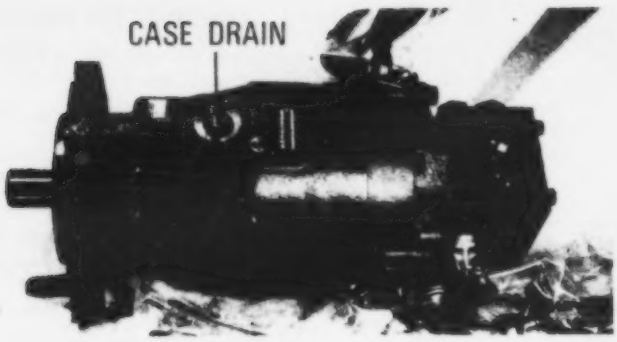


FIG. E

A. REMOVAL

1. Loosen the reservoir cap to relieve any system pressure.

2. Place drain pan or bucket under the motor.

3. Remove the three (3) hoses. Place clean plastic plugs and bags in lines and plug motor ports to prevent draining entire system. (Do not use rags).

4. Remove the four (4) mounting bolts.

5. Place a sling or similar support around motor and remove from application.

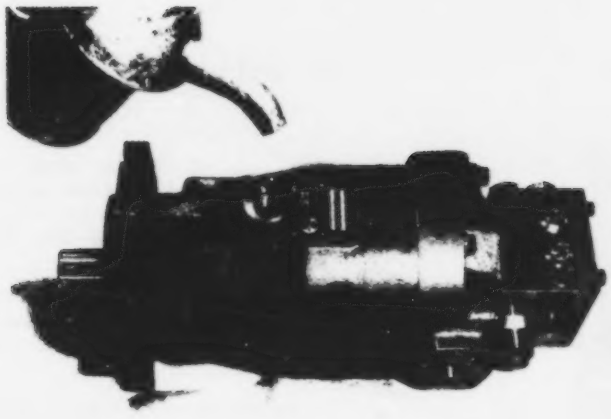


FIG. F

B. INSTALLATION

1. Mount motor on application using the four (4) mounting bolts.

2. Remove all shipping plugs as lines are installed. See plumbing diagram at rear of bulletin for correct line installation. Be certain lines are tightened to correct torques.

NOTE: *It is recommended that the motor case be filled by hand to assure proper lubrication upon start up. See Figure F.*

replacement of charge pump

BULLETIN 9482
SECTION 3

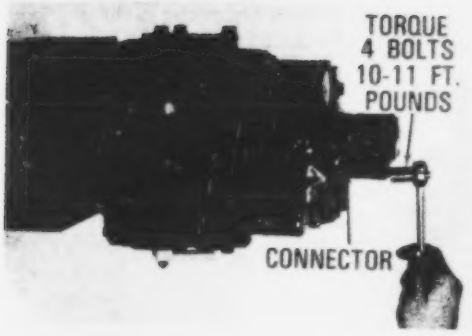


FIG. G

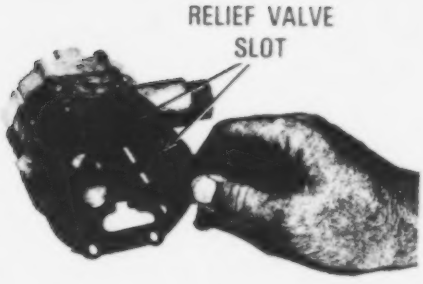


FIG. H

FIG. I

A. REMOVAL

1. Remove the line connecting charge pump to reservoir and plug with clean plastic plug to prevent draining of reservoir.

2. Remove the four (4) capscrews.

NOTE: *Do not remove the capscrew at the top and bottom of the charge pump, as these hold the charge pump together. See Figure G.*

3. Pull charge pump away from main pump.

NOTE: *Do not use sharp tools to pry charge pump from main pump. A scratch on the sealing surface may cause a leak. If charge pump does not pull loose, tap lightly on side of charge pump with plastic hammer to break paint or gasket seal.*

B. INSTALLATION

1. Install a new gasket. Make sure the new gasket is properly installed. See Figure H. If positioned wrong the relief valve port is covered by the gasket.

2. Line up the drive tang on charge pump shaft with slot in main pump shaft. See Figure I. The charge pump should assemble freely with main pump freely. Do not force charge pump into position.

3. Torque the four (4) mounting bolts to 10-11 ft. lbs.

replacement of charge pump

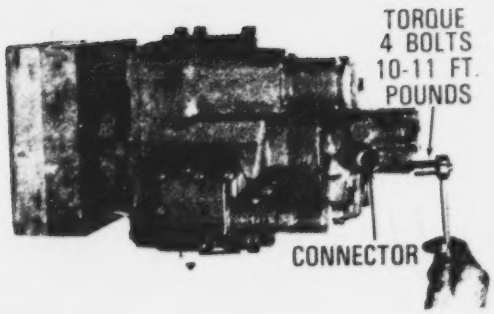


FIG. J

4. Install connector to charge pump. Torque 14-20 ft. lbs.

5. Install line from reservoir to connector on charge pump.

NOTE: *Excessive tightening may distort charge pump and cause leaks or malfunction.*

6. Check oil level in reservoir.

replacement of check valves

BULLETIN 9482
SECTION 4

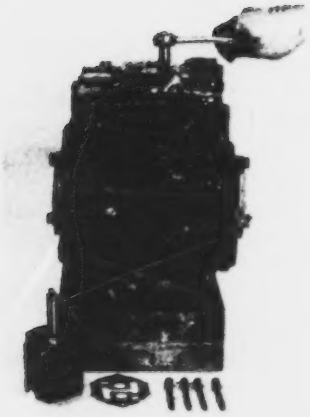


FIG. K

FIG. L

A. REMOVAL

1. Remove charge pump. See Section 3.

2. Using a drag link, unscrew check valve from end cap. See Figure K.

NOTE: *There are two check valves. It is advisable to replace both check valves when servicing unit. See Figure L.*

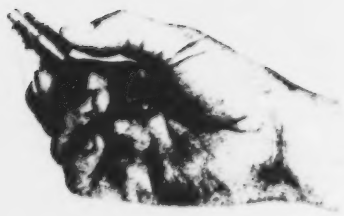


FIG. M

B. INSTALLATION

1. Prior to installation, inspect "O" rings for damage. See Figure M. Apply a light coat of oil.

On 20 through 23 series pumps, torque check valves 30-40 ft. lbs.

On 24 through 27 series pumps, torque check valves to 80-90 ft. lbs.

NOTE: *The checks must be below the face of the end cap. See Figure K*

replacement of manifold

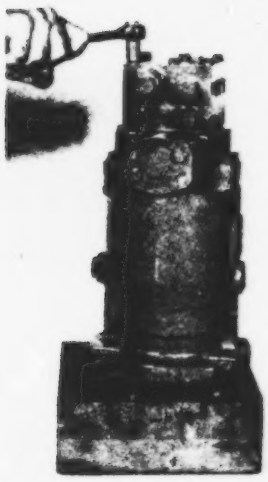


FIG. N

FIG. P

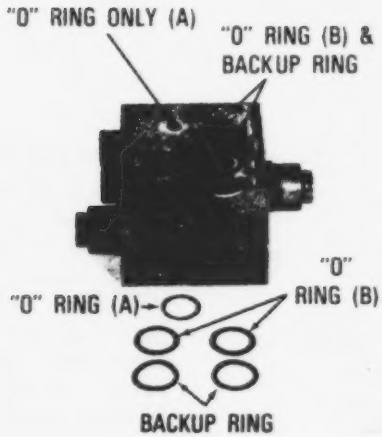


FIG. Q

A. REMOVAL

1. Prior to removal of manifold assembly, remove all dirt and clean area where manifold assembly is attached to end cap.

2. Place drain pan under manifold to catch oil.

3. Remove the four (4) corner bolts holding manifold to motor end cap. See Figure N.

4. Grasp manifold to prevent it from dropping and remove remaining two (2) mounting bolts. See Figure P. There is no gasket between the manifold and end cap. Sealing is obtained by "O" rings and back up rings.

B. INSTALLATION

1. Use new "O" rings and back up Rings.

2. The two grooves side by side require an "O" ring and back up ring. The "O" ring goes into the groove first. Then install the back up ring on top of the "O" ring. The flat side of the back up ring faces away from the "O" ring.

3. The remaining groove requires only an "O" ring. See Figure Q.

4. Place manifold against motor end cap. Install bolts being certain "O" rings *did not* slip from their grooves. Torque bolts 19-21 ft. lbs.

5. Check reservoir for oil level.

replacement of high pressure relief valves

BULLETIN 9482
SECTION 6

FIG. S

FIG. T

A. REMOVAL

1. Apply a wrench on Hex portion of valve and unscrew from manifold block. See Figure S.

NOTE: *There are two relief valves in manifold block.*

B. INSTALLATION

1. Prior to installation, inspect "O" rings and back up rings for damage.

2. Apply a lubricant to the "O" ring and install in manifold block.

3. Torque valve to 20 ft. lbs.

replacement of displacement control valve

BULLETIN 9482
SECTION 7

FIG. U

FIG. V

A. REMOVAL

1. Remove control linkage from Displacement Control Valve Assembly.

2. Remove the nine (9) capscrews holding valve to pump housing. See Figure U.

3. Lift Valve away from housing and remove cotter pin and washer. See Figure V. Remove pin from link in pump.

NOTE: *Caution must be exercised to prevent these parts from falling into pump.*

4. Remove orifice and "O" rings from control valve, See Figure W.

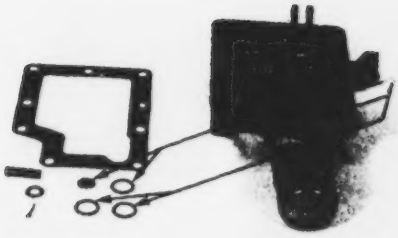


FIG. W

B. INSTALLATION

1. Install orifice, tip down, and new "O" rings in Control Valve.

2. Install new gasket on control valve dry.

3. Install pin in control valve links and pump link.

4. Place washer in pin, install cotter pin and spread.

NOTE: *Caution should be exercised during installation of these parts to prevent them falling into unit. Lightly coating parts with petroleum jelly (not grease) is advised.*

5. Install valve to pump and torque the nine (9) bolts 10-11 ft. lbs.

replacement of motor or pump shaft seal

BULLETIN 9482
SECTION 8

FIG. Y

FIG. Z

FIG. AA

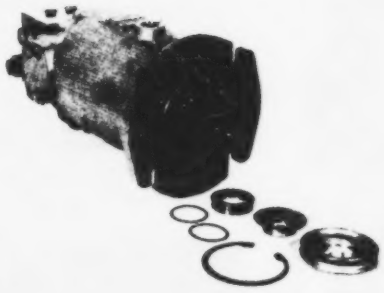


FIG. CC

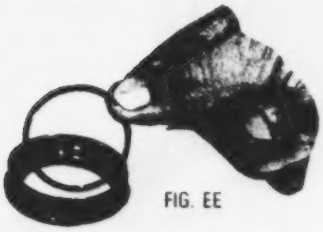


FIG. EE

FIG. DD

A. REMOVAL

1. Remove unit from installation. See Section 1 or 2.

2. Insert Tru-Arc #7 pliers in snap ring holes, compress ring and roll out. See Figure Y.

3. Remove aluminum seal retainer with screwdriver. See Figure Z.

4. Remove steel stationary seal (This generally comes out with retainer). See Figure AA.

5. With fingers or two screwdrivers remove bronze rotating part of seal from drive shaft. See Figure FF.

6. See Figure CC and account for all the parts shown.

B. INSTALLATION

NOTE: *Always replace both stationary and rotating parts of seal. Do not mix old and new parts.*

1. Wash and clean air dry new seal parts.

2. Install the seal springs into aluminum seal retainer. Install new "O" rings dry on stationary steel part of seal and place seal into retainer so notch is located in pin in retainer. See Figure DD.

3. Install large "O" ring on O.D. of retainer. See Figure DD.

4. Install new "O" ring in I.D. of bronze rotating part of seal. See Figure EE.

replacement of shaft seal

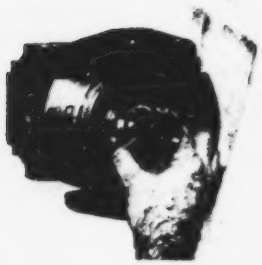


FIG. FF

5. Wrap a piece of plastic around drive shaft and slide rotating bronze part over shaft making sure it is seated. Do not press on seal surface. See Figure FF.

6. Install stationary seal and retainer into place and press retainer in so snap ring groove is open. See Figure GG.

7. Close snap ring with pliers. Install snap ring with tapered edge out.

8. For ease of installation start snap ring in groove with side opposite snap ring holes. See Figure HH.

FIG. GG

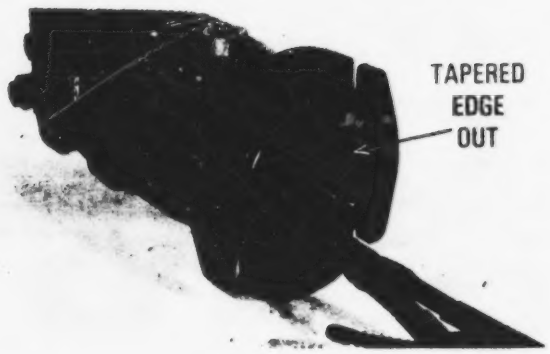


FIG. HH

HYDROSTATIC TRANSMISSION START-UP PROCEDURE (Figures 26, 27, 28 and 29)

The hydraulic system has been filled at the factory; however, if for some reason the system has been drained (Refer to Page , Draining and Refilling the Hydraulic Oil System), the following start-up procedure is recommended.

NOTE

One common tank supplies oil for the traction drive system, vibrator control system and the power steering system.

The method of filling the hydraulic oil tank is based on passing the oil thru a #10 micron filter as recommended by the "Sundstrand Corp.", manufacturers of the hydrostatic pumps and motors used on the Rollers. The filter system (10 micron) is outlined on pages 71 and 72.

During the start-up procedure, the hydraulic system will be noisy due to air in the system. As the start-up progresses, the system will be relieved of the air and voids as oil fills these cavities.

1. Make sure a *new and clean* oil filter has been installed in the tank and the tank cover replaced tightly.

2. Place the "forward-reverse travel lever", item 14, page 9, and the "vibration control lever", item 13, page 9, in neutral (detent position).

3. Remove filler cap from the tank and leave the cap off until after the start-up is completed.

4. Add a recommended oil to the tank using system as outlined on page . If a system of this requirement is not used, ***the oil must be passed thru a #75 micron filter or a #200 mesh screen.***

5. Fill tank to sight gauge level. As oil seeps thru the internal tank filter, into the system, the oil level will drop. Continue adding oil until the level stabilizes at the sight gauge level. This may require a period of 20 to 30 minutes. ***CAUTION: At this point the complete system is not filled.***

6. Start engine and RUN AT IDLE SPEED (NO FASTER) DO NOT REV. UP ENGINE. Run at idle speed for a period of 5 minutes. This will purge air from the system as oil fills the cavities. Turn steering wheel during this step from left to right and vise-versa. Steering will be felt in "jerks" as air is purged from the steering system. When all air is purged, steering will be smooth and decisive. Stop engine. Add oil to sight gauge level.

7. Again start engine and run at approximately 1000-1300 RPM for a period of 5 minutes. Check for any oil leaks. Return to idle speed, then stop engine. Add oil to tank if necessary.

8. Up to this point, the hydraulic system has been run with the pumps and motor in neutral position, and the oil has been going thru a "by-pass" system back to the tank.

9. If the traction drive pump has been replaced, proceed with step 9A – "Setting external pump lever arm stops," figure 27. If the vibration control pump has been replaced, refer to page 17, "Vibration Frequency Adjustment." Then continue with step 10.

A. Set External Pump Control Lever Arm Stops, figures 28 and 29. Figure 27. Remove the pump control cable from the pump control lever arm. Loosen lock nuts and back off on adjusting screws. Manually move the pump control lever arm in one direction to its maximum stroke. This will "bottom" the lever arm internally inside the pump. Now adjust the setscrew

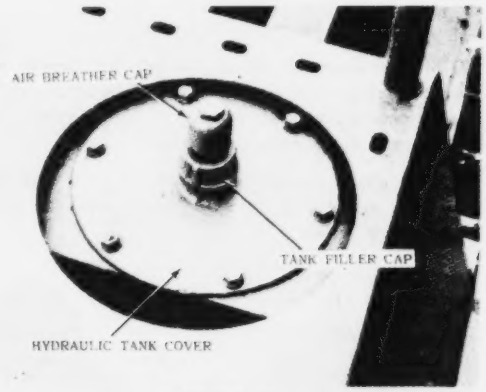


FIGURE 26

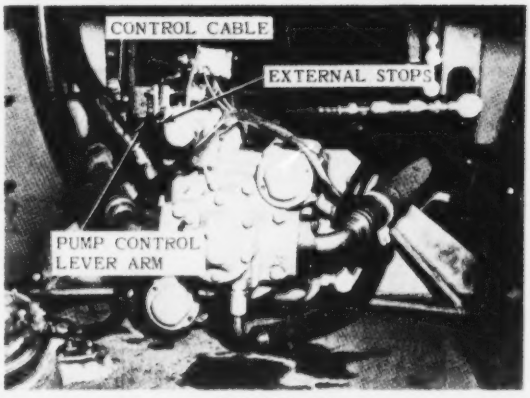


FIGURE 27

enough so the pump lever arm DOES NOT "BOTTOM" INTERNALLY, BUT "BOTTOMS" AGAINST THE SETSCREW. TIGHTEN DOWN LOCK NUT. Repeat the above in the opposite direction.

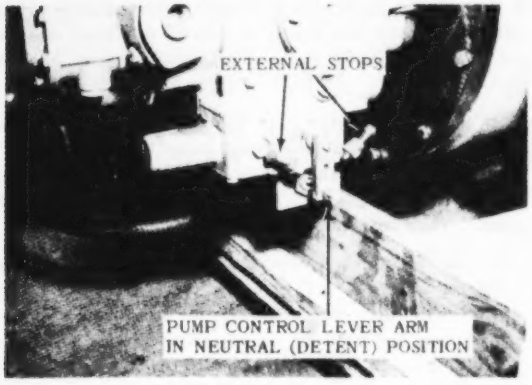


FIGURE 28

B. Reconnect pump control cable.

10. Start engine and set at full throttle. *Slowly* engage the forward-reverse travel lever to maximum stroke in one direction and maintain for a few minutes. Repeat the above in the opposite direction.

11. The above procedure should purge all of the air from the system. Replace filler cap and maintain breather cap clean.

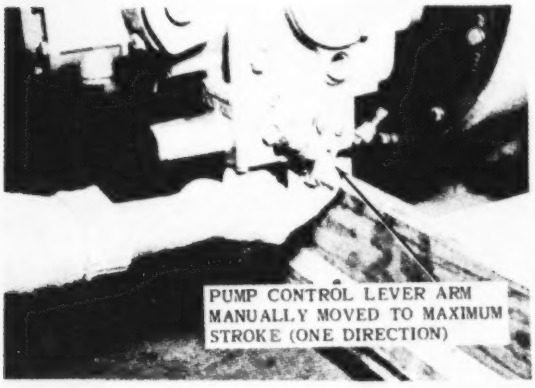


FIGURE 29

FILLING VIBRATORY ROLLER HYDRAULIC OIL SYSTEM UTILIZING A PRE-FILTER (10 MICRON) AND AN AIR DRIVEN HYDRAULIC PUMP

1. To recommend a hydraulic oil system filling procedure to help in eliminating the following which otherwise could cause almost immediate hydrostatic pump and/or motor failure.
   a. Eliminate the possibility of a "dry startup" by purging as much air from the system as possible prior to the initial startup procedure.
   b. Eliminate contamination from entering the system.
2. To provide a list of material to make a pumping and pre-filtering unit as shown in figure 1. It is vitally important that the oil entering the system be filtered thru a #10 micron filter. This is to meet a requirement of the "Sundstrand" Corp. and also to coincide with the standard filling and pre-filtering procedure used for initial start-up.

FIGURE 1

GENERAL:

The pump (A) shown in figure 1 is a "Lincoln" Power Master 2, Model 82734, 4-1 ratio, and must be fitted with the necessary air control devices.

The filter (B) is a "Bendix" Model #574743 with a #10 micron filter element #038082. The filter is a non-bypass type. Element is of the disposable type.

The system operates on a ***maximum 35 PSI*** air pressure which the incoming air is controlled by adjusting the Air Regulator (G) to 35 PSI and is read on the air gauge (E).

Adjust the Bleed-Off (safety valve) (F) to bleed or exhaust air pressure in excess of 40 PSI.

The rupturing pressure of the filter element within the filter (B) is 150 PSI. ***CAUTION: Do not exceed the maximum 35 PSI air pressure with the 4-1 ratio oil pump or else the element will be ruptured.***

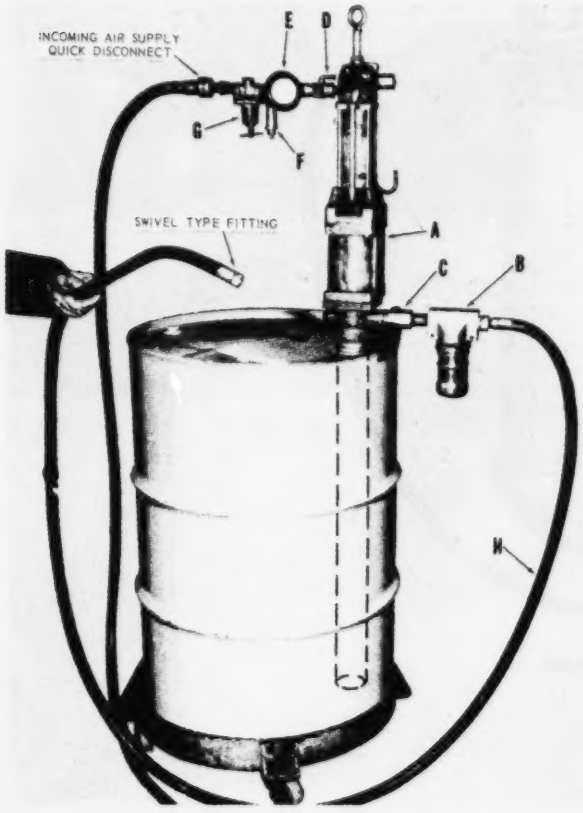
Flush out hose (H) and its fittings before use. Keep hose end plastic capped when not in use.

The purpose of the ball type Check Valve (C) is to eliminate a back pressure against the oil pump during surges of the pump.

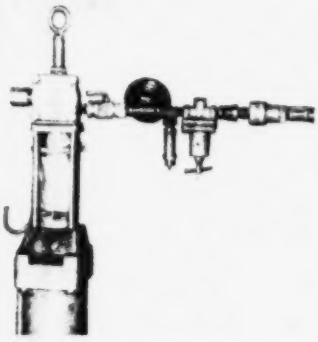
IMPORTANT: Oil Filter Element Change – When the filter element becomes plugged or clogged, oil will not penetrate the element. Consequently an air back pressure will take place and this will be noticed by the hissing noise of air escaping thru the Bleed-Off Valve (F). Change filter element, 10 micron.

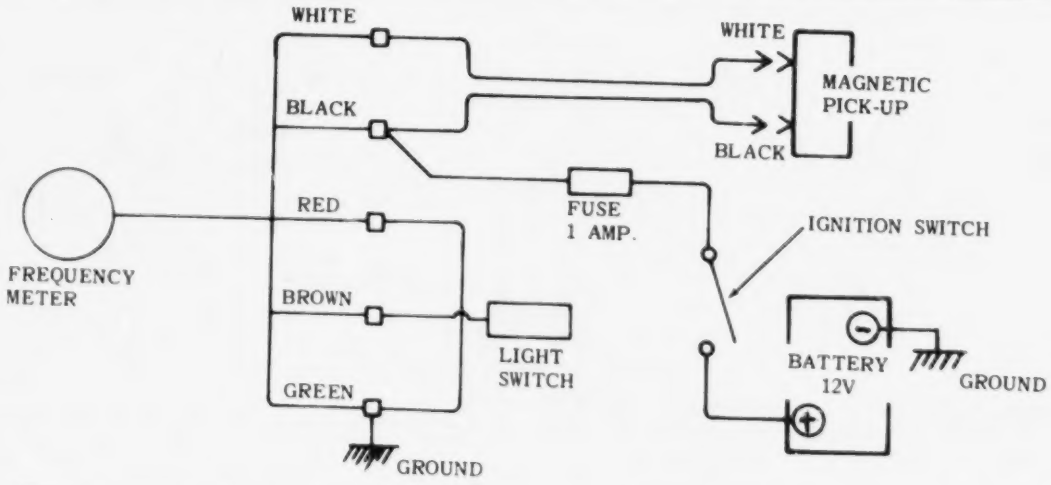
List of Material

A. Power Master 2" Air Motor (4-1 ratio) Lincoln Eng. Co.
B. Filter and Filter Element (10 Micron) Bendix Co.
C. Check Valve, Ball Type, Republic Co.
D. Air Shut-Off Cock, Brass
E. Air Pressure Gauge (0-160 PSI) Marsh Co.
F. Air Bleed-Off Valve, Rockford Co.
G. Air Pressure Regulator (¼" – 10-125 Pounds) Regulator Co.
H. Hydraulic Hose ¼" I.D. (Cut Length to Suit.) Plus necessary pipe and fittings to connect and/or assemble the above items.

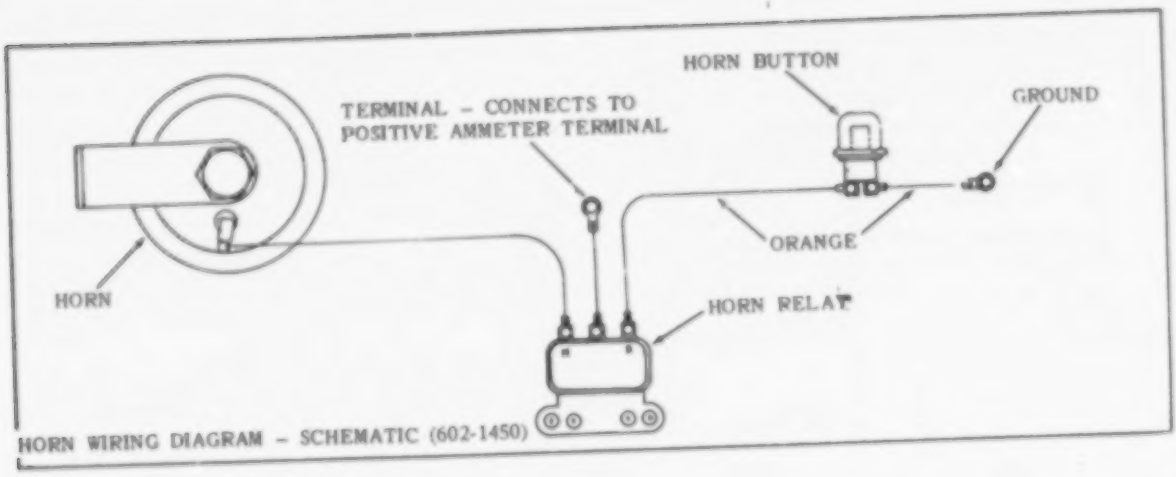


BACK SIDE

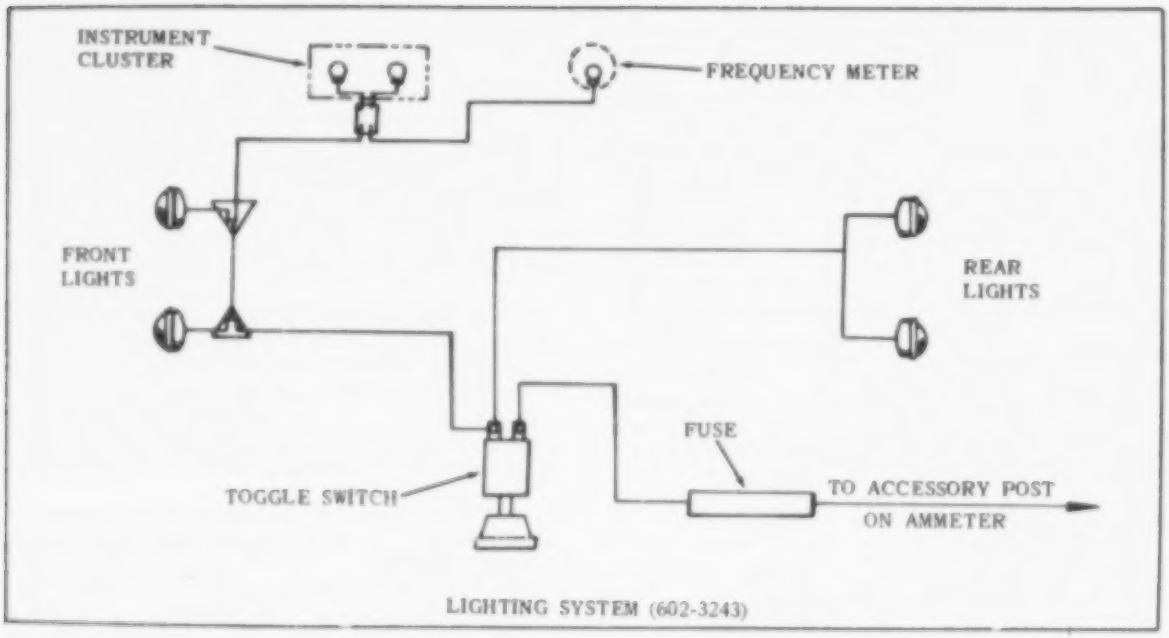




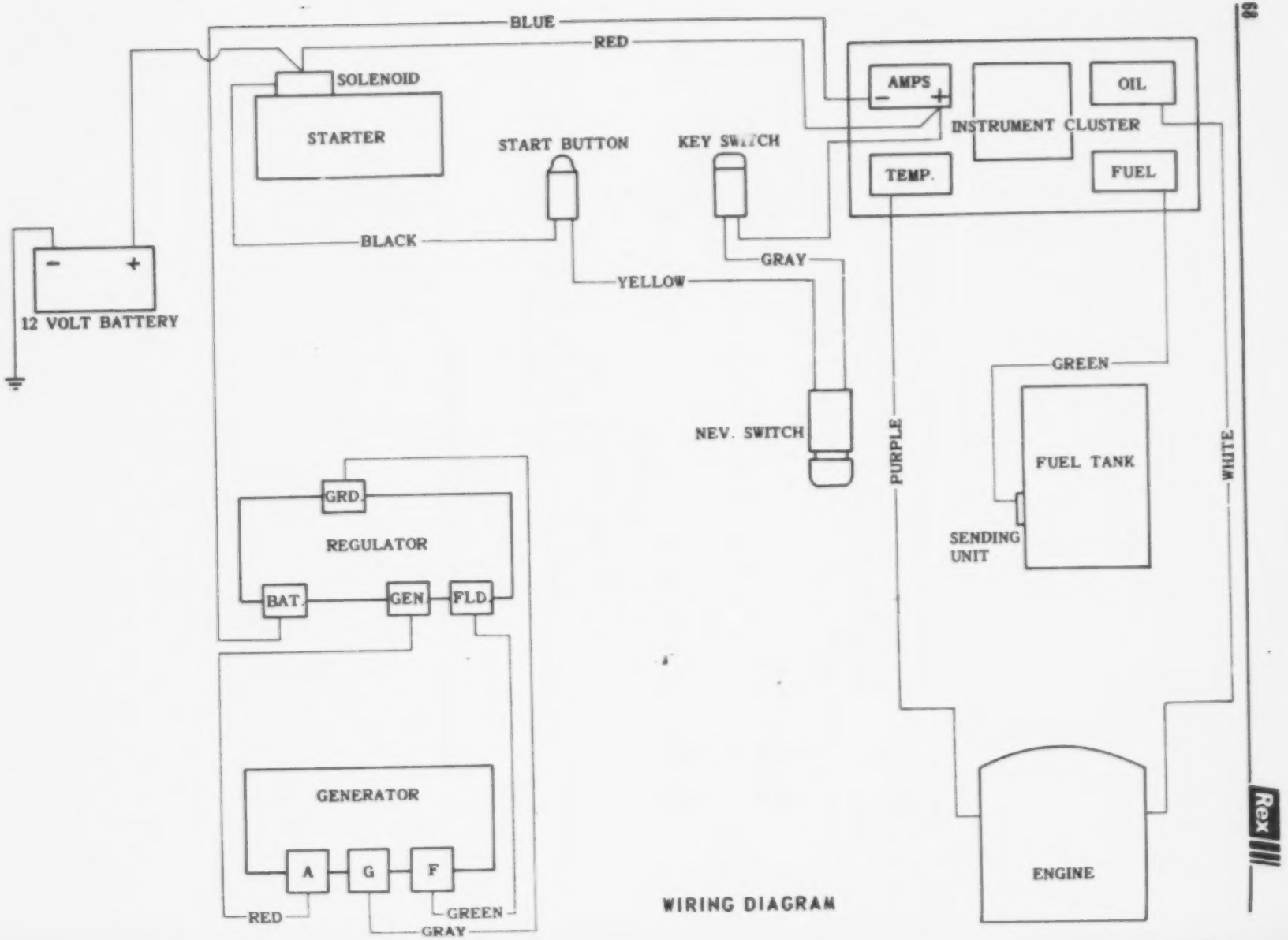
WIRING DIAGRAM FOR FREQUENCY METER (602-1427) POSITIVE GROUND SYSTEM



HORN WIRING DIAGRAM - SCHEMATIC (602-1450)



LIGHTING SYSTEM (602-3243)


BLUE
RED
SOLENOID
STARTER
START BUTTON
KEY SWITCH
AMPS
OIL
INSTRUMENT CLUSTER
TEMP.
FUEL
BLACK
GRAY
YELLOW
12 VOLT BATTERY
NEV. SWITCH
GREEN
FUEL TANK
SENDING UNIT
PURPLE
WHITE
GRD
REGULATOR
BAT
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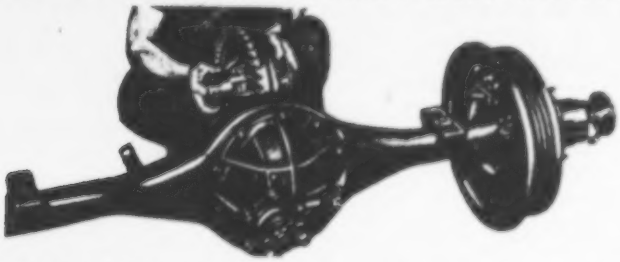
Rex

NoSPIN REMOVAL AND INSPECTION



BEFORE REMOVING NoSPIN FOR INSPECTION, BE SURE TO CHECK THE ROLLING DIAMETER OF THE REAR TIRES. Half of our complaints are caused by the rolling diameters of the rear tires being unequal.

It is suggested that you pay particular attention to "Facts You Should Know About Your NoSPIN Differential" on the back cover of this manual, as well as "Checking NoSPIN Performance in the Vehicle" on Page 6.

Remove the axle shafts and follow the vehicle or axle manufacturer's manual for removal of the differential case and ring gear assembly.

If an axle shaft has failed, be sure all fragments of the shaft are removed. Obviously these steel particles can cause severe damage to the pinion and ring gear or NoSPIN.

Do not remove the ring gear unless it is necessary for separation of the case halves.

The original retaining bolt and washers, if available, can be used to hold the NoSPIN assembled while the case is disassembled. Otherwise, hold the case firmly as the last case bolt is removed because the NoSPIN is assembled under spring pressure and must not be allowed to fly apart.

Remove the assembly from the case and release the retainer bolt. Hold the assembly firmly to absorb the sudden release from spring pressure.

If removal of the center cam is desired, expand the snap ring outward into the spider with small screw drivers or tapered wedges. The center cam can then be pressed through the spider.

The split type holdout ring on models of the Silent-type and Silent-Overrunning-type can be removed with snap ring spreaders.

If removal of the holdout ring is necessary on the Silent-type or Silent-Overrunning-type NoSPIN using friction springs, place small pieces of heavy shim stock between the friction spring and cam ring. The friction spring curves inward and seats under a groove. A shim must be placed at each of these points so that the holdout ring can be lifted off.

It is important that all parts be thoroughly cleaned for this visual inspection.

Check the splines on the side gears and clutch members. Remove any burrs or small chipped edges with a stone or electric burr grinder. If large sections of the spline are broken away, replace the part. Check the side gear hubs for fractures.

Check the spring heights. They should be within ¼" of original height on large models and within ⅛" of original height on smaller, L, LS, B, E, J, KS and GS models.

FREE HEIGHT OF NEW SPRINGS

Model	Pt. No.	Height	Model	Pt. No.	Height
A	62046	3.312	HS-100	63175	2.210
B	62122	2.437	J-JS	61028	3.125
B-27	62693	1.687	J-100, JS-100	63157	2.120
D	61687	2.875	KS	63050	2.375
E	61037	2.562	L-LS	61089	1.625
E-100	63405	2.310	M-MU	61532	3.000
EJ	62213	3.000	N-NS	61293	2.750
GS	63673	1.160	R	61875	2.875
H	61228	2.750	R-100	63455	3.000
H-100	63175	2.210	U	62630	2.780
HNS	61933	3.187	Z	62726	4.430

Holdout rings on some Silent and Silent-Overrunning types are not slotted and frictional resistance is obtained by means of a friction spring. Check for fractures or chipping on the holdout ring, also rounded edges on the lugs of the Silent-Overrunning type. A badly worn or chipped holdout ring can cause chipping of clutch teeth.

Friction spring wear should not exceed .003" at points of contact. Compare with measurement at unworn portion. Note: Unless extreme care is exercised in removing this part, it may be damaged during removal. Replace with new part if, after re-assembly, the frictional resistance is not great enough to require a very firm hand pressure to rotate.

The center cam must be free to rotate within the limits of the keys in the spider. It is not necessary to remove the center cam for inspection unless chips are present or replacement is required.

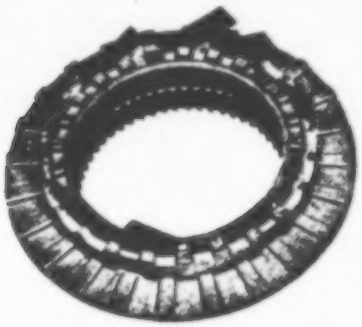
Check the spring retainer for fractured splines or spring seat.

All thrust washers must be omitted unless otherwise specified. The NoSPIN may lock up solid when the case is bolted together if the thrust washers are not omitted.

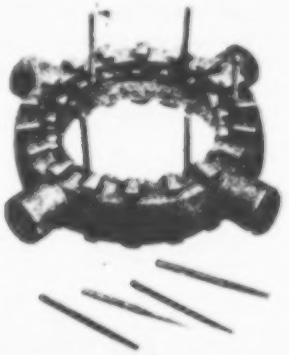
A failure of the hydrogen copper weld between the cam and driven clutch will result in erratic operation by alternately driving on one side only or driving both wheels with the NoSPIN "locked". If a weld failure has occurred it will be possible to rotate the cam ring in the driven clutch by lightly tapping the cams.

Inspect the clutch teeth on the spider and driven clutches. Very slight chips can be touched up with a stone. If excessively chipped or rounded, these parts must be replaced. Compare the tooth form with those on a new part. If a part is replaced due to chipped teeth, always replace the mating part as it may have invisible fractures.

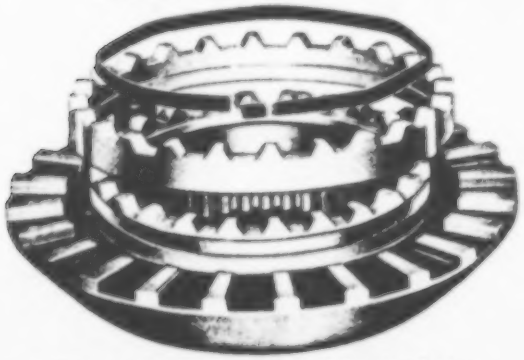
Cams on the center cam and driven clutch must not be excessively chipped. A smooth wear pattern up to 50% of the face width is acceptable on the clutch cam and center cam.



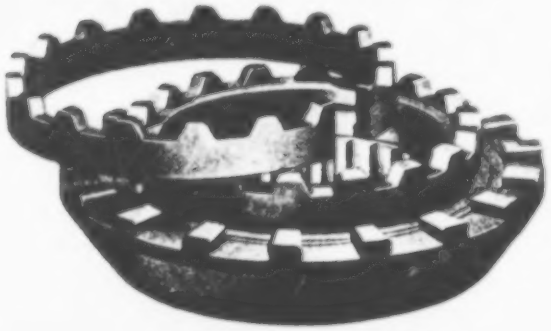
Removal of the solid type Holdout Ring which is retained by a Friction Spring.



Removal of Center Cam on Standard type NoSpin. (Serviced only as an assembly in some models)



Driven Clutch, Holdout Ring and Friction Spring on Silent-type and Silent-Overrunning type.



Slotted Holdout Ring on Silent-type and Silent-Overrunning type.

NoSPIN ASSEMBLY

Check the side gear spline fit on an axle shaft. Be sure the splines do not bind.

Assemble the NoSPIN, being careful to position the spring retainers so that the spring seats inside the cupped section.

A bolt and washers can be used to hold the NoSPIN assembled, *provided the washers are small enough* to pass through the differential case ends after the case bolts are tightened. If this retainer bolt is not available, it is quite easy to assemble by hand pressure, holding in position until a case bolt is started.

Before installing NoSPIN and case assembly in the carrier, again place an axle shaft into each side gear and rotate. It should be possible to feel the backlash between the clutch teeth (about 5/32"). If this backlash cannot be felt, and the side gear is locked solid in the NoSPIN, remove the NoSPIN and check for thrust washers or wrong side gears.

Assemble the NoSPIN, case and ring gear assembly into the carrier and re-assemble the axle in the usual manner.

Lubrication

Lightly lubricate all parts of the NoSPIN as it is being assembled.

No special lubricant is necessary. The NoSPIN will operate well in any lubricant as recommended by the vehicle or axle manufacturer.

Checking NoSPIN Performance in the Vehicle

If the complaint is Locking, Tire scuffing or Tire wear, drive the vehicle in a tight circle on concrete. The outside tire should rotate faster than the inside tire due to its greater arc of travel. There should be no evidence of tire slipping or scuffing.

NOTE: Extremely short wheelbase vehicles having very short turning circles may not have enough traction to drive the vehicle by the inside wheel. It will then slip and rotate at the same speed as the outside wheel when driving. This can occur on small fork lift trucks, or very short wheelbase trucks.

If a Standard-type NoSPIN is being checked, a uniform click or indexing sound will be heard. This indexing sound is more difficult to detect on heavy vehicles and will not be heard at all if a Silent-type NoSPIN is being checked.

Try this while turning both left and right. If there is no differential action, tire scuffing will result and the NoSPIN must be removed for inspection.

Another check to determine if the NoSPIN is locked up is to raise both wheels off the floor and rotate one wheel forward while an assistant holds the opposite wheel firmly rearward. (Leave truck in gear with engine off). Repeat this test holding the opposite wheel rearward. Then repeat test in reverse direction on both sides. The rotating wheel should cam out easily by hand and a series of uniform clicks will be heard if operating properly. There will be only slight clicks audible from the Silent-type NoSPIN. If the wheels cannot be rotated freely as described above, remove and inspect the NoSPIN.

If the complaint is jerking, determine if this occurs as the throttle is advanced at moderate speeds on the highway or when pulling in low gear under high engine torques. Unequal tire rolling radii due to wear, unequal air pressures or load on one side can cause jerking at normal highway speeds with a throttle change. This will also cause a continuous clicking in the NoSPIN which can be heard in light trucks using the Standard-type NoSPIN. Check the tire pressures. If jerking or clicking continues, check the rolling radii from the ground to the rim or ground to axle shaft flange. This distance must be reasonably equal on each tire.

The rolling diameters of the rear tires can also be checked by placing chalk marks opposite each other on the rear tires. Drive the truck a short distance in a straight line. If the rolling diameter is off, the marks will be in a different location. Correct by changing air pressure in present tires until chalk marks remain in same relative position.

If the NoSPIN has worn clutch teeth, they may slip out of engagement under heavy torque loads, resulting in a loud snap and severe jerk of the vehicle. This may occur in low gear at near full throttle. Not completely conclusive, but of some value, is a test made by spinning the wheels in low gear while the truck is in bumper contact with a solid object. (Another truck can be used with the brakes locked). A gravel surface would be less likely to damage the vehicle during this test. If a loud snap results or complete loss of power to one wheel occurs, the NoSPIN should be removed for inspection.

A certain amount of backlash exists in the NoSPIN. This space is necessary to allow the clutch teeth to dis-engage when turning corners. Actually it amounts to about 5/32" but is greater at the propeller shaft because it is multiplied by the axle ratio.

This backlash can amount to 1/3 to 1/4 turn of the propeller shaft as it includes additional clearances such as splines and gear tooth clearances. It is not detrimental to NoSPIN performance or vehicle and does not indicate a defective NoSPIN.

A throttle change may result in an occasional single snap. This is caused by the sudden release of drive from one clutch to another due to momentary partial engagement.

This occasional snap does not indicate a defective unit. It is a normal characteristic of the NoSPIN, more noticeable in light vehicles.

For complete description of the NoSPIN, see the Operation Manual.

FACTS YOU SHOULD KNOW ABOUT YOUR NoSPIN DIFFERENTIAL

The NoSPIN Differential provides positive drive to both wheels of the axle in which it is installed and allows differential action when required. The performance of a truck equipped with the NoSPIN will be somewhat different from that of one with a standard differential. For example:

1. When turning a corner the outside wheel must rotate faster than the inside wheel, otherwise serious tire scuffing would occur. When driving around a turn, the NoSPIN clutch driving the outside wheel is automatically disengaged permitting this wheel to rotate freely until the turn is completed at which time it is reengaged.

   While the turn is being made there will be a series of clicking sounds resulting from the alternate disengagement and engagement of the differential clutch teeth on the outside clutch. These clicking sounds, which are quite audible in small trucks and pickups, are not so pronounced in larger trucks, and are normal in the Standard-type NoSPIN.

2. When driving straight ahead a continuous click may be heard if the tires are not equal in rolling radii due to unequal wear or unequal inflation. This, of course, can be corrected by matching up the tires and checking pressures periodically. If clicking continues, adjust tire pressures so that the distance from the ground to the rim is equal.

   NOTE: The above conditions apply to the Standard-type NoSPIN. In the Silent-type NoSPIN only an occasional click will be heard as the NoSPIN clutch reengages.

3. If, with either type NoSPIN, you get a pull to the right or left, particularly when accelerating check the tire pressure and rolling diameters of the rear tires. (Also, if the load is on one side of the truck you may get a pull to the right or left.)

4. In short wheelbase trucks and tractors having a very short turning circle, you may get some reaction on the steering when making a turn under power. By letting off on the throttle for an instant, you will reduce the torque to the rear wheels which will permit the truck or tractor to go into the turn.

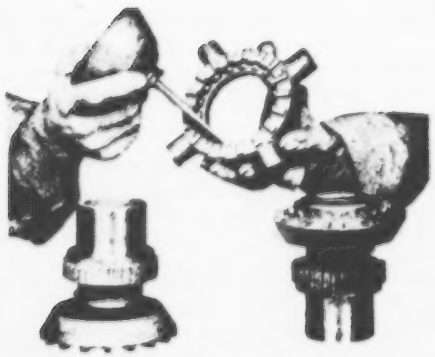
5. An increase in the amount of backlash is also normal in both types. This is purposely built into the NoSPIN to allow the clutch teeth to disengage or reengage automatically when travelling forward or backward during the turn.

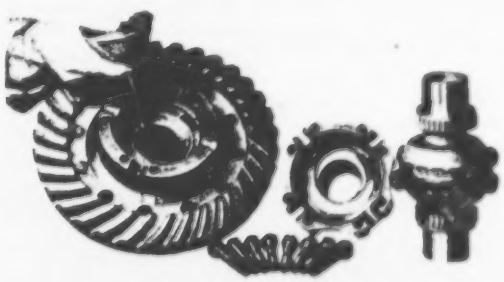
6. The amount of backlash in the NoSPIN is a fixed amount which does not increase appreciably with use. The total backlash in the entire drive system including the transmission, joints, various splines and gears will develop a noticeable increase as mileage increases, due to normal wear of these parts.

7. When alternately accelerating and decelerating during a turn you may hear an occasional snapping noise as the torque is being alternated from "driving" torque to the inside wheel to "braking" torque from the outside wheel.

8. When making a turn in loose gravel or in other conditions of poor traction with the outside clutch member momentarily disengaged, the inside wheel may receive so much torque that it will slip or scuff momentarily until power is being transmitted to both wheels. Whenever traction conditions are so poor that there is not enough traction under one wheel to drive the vehicle, the inside tire will continue to slip or scuff until the turn is completed. This condition is more noticeable in cars or lightly loaded vehicles.

Rotate to engage splines if assembly retainer bolt and washers are not used.





Lightly lubricate parts prior to assembly.

SILENT-TYPE NoSPIN Differential

General Information and Brief Description of Its Construction and Operation

GENERAL INFORMATION

The requirement for a full automatic locking two-way overrunning clutch or differential, for use in transfer and drop cases of multi-axle vehicles as well as driving axles of all types of commercial vehicles and passenger cars, has been evident to users of automotive vehicles for a great many years.

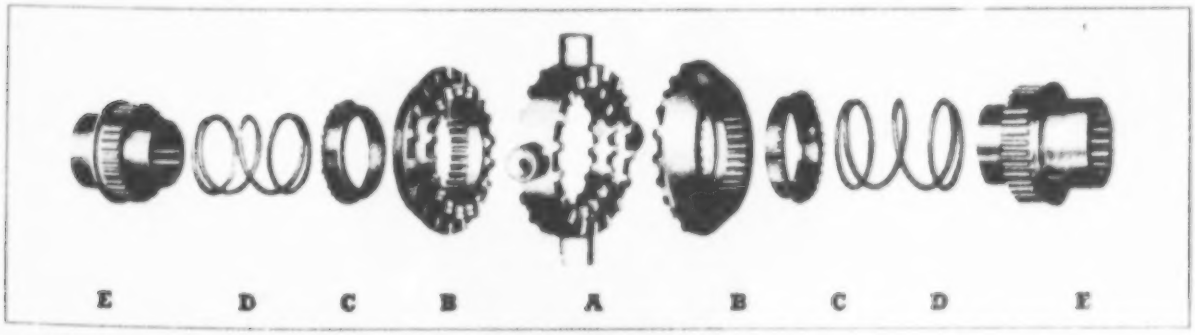
Detroit Automotive Products' engineers, in constant search for a simpler and silent means of preventing individual wheel-spin in driving axles of light weight vehicles and the elimination of trapped-torques between driving axles, have developed the silent-type NoSPIN Differential, briefly described hereunder.

The principle on which this device operates is very similar to the regular type NoSPIN Differential set forth in the forepart of this Manual. The primary difference in this device is that it may overrun continuously until this movement is completed then it automatically returns to full locked engagement, whereas with the regular NoSPIN during the overrunning cycle the clutch teeth of both the driving and driven members re-engage after each tooth, causing a slight indexing sound. Positive drive is assured by each type of mechanism when traction is lost on either side of the device. Both types then remain locked and each side **must** rotate at ring gear speed until normal overrunning is required for turns or the negotiation of uneven terrain.

CONSTRUCTION

The clutch members of the silent-type NoSPIN Differential are held out of engagement while overrunning by the automatic positioning of rotatable "hold-out" Cam Ring mounted on each Driven Clutch Member. See Figures 11, 13 and 15.

The exploded view of a typical silent-type NoSPIN Differential, together with the nomenclature of the respective components, is shown in Figure 11.



A—Spider-Center Cam Ass'y B—Driven Clutch Members and "Hold-out" Cam Rings C—Spring Retainers D—Springs E—Splined Side Members

FIGURE 11

As may be seen in Figure 12, the Spider and Center Cam Assembly of the silent type differential is quite similar to that of the regular NoSPIN except that the Center Cam has wider cam teeth to carry the two sets of cams on each Driven Clutch Member, one fixed, the other rotatable. Note the Spider has one long tooth or key on its inside diameter which engages a slot, of predetermined width, in the Center Cam. This slot limits the travel of the Center Cam to either side of the clutch teeth of the Driven Clutch Member as

Silent-Type NoSPIN Differential (*Fully Automatic*)

required to permit the unlocking and locking action of the differential assembly in either direction.

The rotatable "hold-out" Cam Ring is mounted over the outer diameter of the fixed cam ring of each driven clutch member as shown in Figure 13. The gap between the ends of the "hold-out" ring meshes with the long tooth or key of the Spider as the Driven Clutch Members and other components are brought together to complete the differential assembly shown in Figure 14.

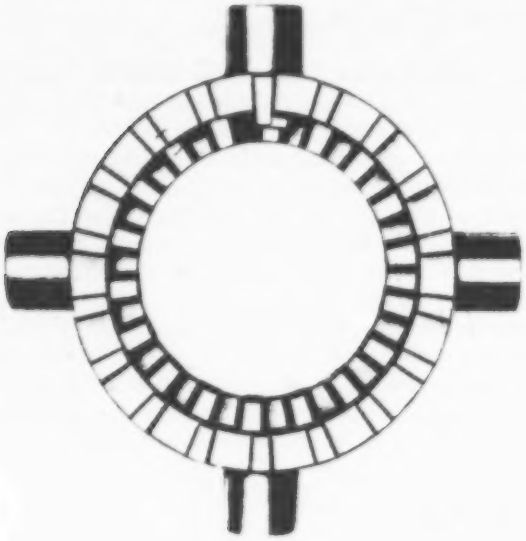


FIGURE 12

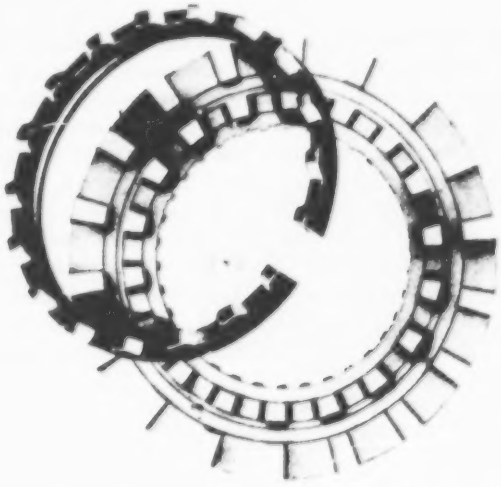


FIGURE 13

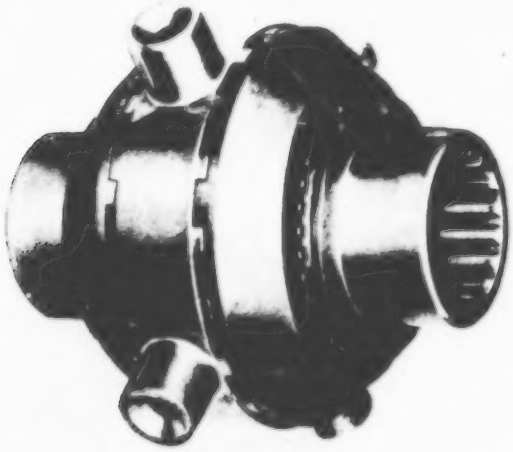


FIGURE 14

TIRE PRESSURES – Check daily.

23.1 x 26 Diamond Tread – 15 PSI (SP848)

IMPORTANT
ENGINE COOLING SYSTEM

Several brands of permanent antifreeze are available with sealer additives. The specific type of sealers vary with the manufacturer. Antifreeze with sealer additives is *not* recommended for use in Detroit Diesel engines due to plugging problems throughout various areas of the cooling system.

IMPORTANT:

DRAINING AND REFILLING THE HYDRAULIC OIL SYSTEM

Before opening any portion of the hydraulic oil system – namely removing the reservoir tank cover, filler cap or disconnecting any hoses, it is extremely important that the opening points and immediate areas around these points be cleaned with a solvent and blown air dry.

Almost immediate component failure will result if foreign material is allowed to enter the system. Avoid opening the hydraulic system in dust laden areas.

Do not open hydraulic lines or components that are under pressure. Shut off engine and make sure engine cannot be started.

Do not drain oil or open system if components are hot to touch. Wait until oil cools.

Do not attempt to reclaim drained oil for reuse.

A. Changing Oil

1. Under normal preventative maintenance, the recommended oil change period is every 2000 running hours.

   At the time of changing oil under normal preventative maintenance (2000 hours), it is only necessary to drain the oil from the reservoir, and this also includes installing a new oil filter element (10 micron). When adding clean oil to the reservoir, pour the oil thru a 75 micron filter or #200 mesh screen if a 10 micron system is not available.

2. A complete oil system change must be made if the following has occurred. This also requires a new oil filter element (10 micron).

   a. Replacement of the hydraulic pump and/or motor.

   b. A blown hydraulic hose.

   c. The filter (vacuum gauge) indicates in the "red". This is an indication of a plugged filter element.

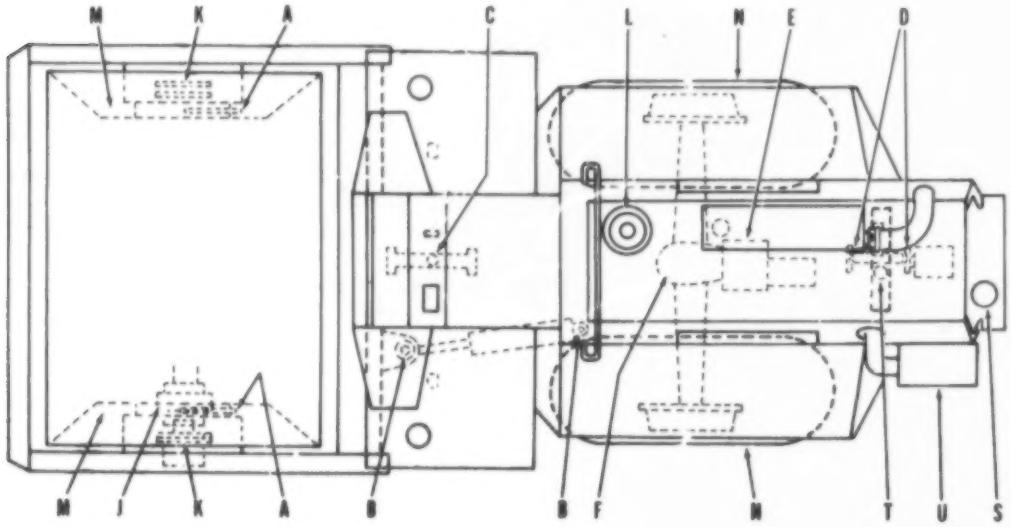
   d. The oil temperature gauge indicates in the "red". Consult Trouble Shooting Chart.

   Any time a complete oil system change is made, install the new oil filter element first.

LUBRICATION CHART SP848

REF.	DESCRIPTION	LUBRICANT	REMARKS
A	VIBRATOR SHAFT BEARINGS	EP #2 (SHELL DARINA ONLY)	DAILY – 2 FITTINGS, 1 EA. SIDE. HAND GUN ONLY. SIX STROKES EA. FITTING
B	STEERING CYLINDER ENDS	*MOBILGREASE 77	WEEKLY – 2 FITTINGS
C	ARTICULATING JOINT BEARINGS	*MOBILGREASE 77	WEEKLY – 4 FITTINGS
D	UNIVERSAL JOINTS AND SLIP JOINT	*MOBILGREASE 77	WEEKLY – 3 FITTINGS
E	TWO-SPEED TRANSMISSION	*MOBILUBE HD80-90	CHECK LEVEL WEEKLY – DRAIN, FLUSH AND FILL TO LEVEL PLUG EVERY 500 HOURS. CAPACITY: 4 QTS.
F	AXLE DIFFERENTIAL	*MOBILUBE HD80-90	CHECK LEVEL WEEKLY – DRAIN, FLUSH AND FILL TO LEVEL PLUG EVERY 500 HOURS. CAPACITY: 4½ QTS.
J	GEAR COUPLING – HYD. MOTOR TO VIBRATORY SHAFT	*MOBILGREASE 77	REPACK EVERY 6 MONTHS – REMOVE HYD. MOTOR AND DEPOSIT 2 OUNCES THRU SPLINES.
K	ROLLERS BEARINGS	*MOBILGREASE 77	RE-HAND PACK EVERY 2000 HRS.
L	HYDRAULIC OIL SYSTEM (REFER PAGE 84)	*MOBILFLUID 300**	CHECK LEVEL WHEN OIL IS COLD. ADD OIL IF NECESSARY. CHANGE OIL AND OIL FILTER, 10 MICRON (IN TANK) EVERY 2000 HOURS. WHEN ADDING OR CHANGING OIL, POUR OIL THRU A #75 MICRON FILTER OR #200 MESH SCREEN. CAPACITY: APPROX. 34 GALS. MAINTAIN TANK BREATHER CAP CLEAN.
M	PNEUMATIC ISOLATORS	–	CHECK TIRE PRESSURE DAILY. MAINTAIN TIRE PRESSURE AT 25 P.S.I.
N	TRACTION TIRES	–	CHECK TIRE PRESSURE DAILY. REFER TO PAGE 84 FOR MACHINE AND TIRE PRESSURES.
S	ENGINE FUEL TANK	DIESEL FUEL OIL #2D	FILL AS REQUIRED. CAPACITY: 55 GALS.
T	ENGINE COOLING SYSTEM (REFER PAGE 84)	WATER – FREE OF MINERALS – ANTI-FREEZE WHEN REQUIRED	CHECK DAILY. FILL AS REQUIRED. CAPACITY: 21 QTS.
U	ENGINE AIR CLEANER (DRY TYPE)	–	CLEAN BOWL DAILY. REPLACE FILTER ELEMENT WHEN INDICATOR SHOWS IN THE "RED".

*USE MOBIL OIL PRODUCT (OR EQUIVALENT).
**IF IT IS NECESSARY TO ADD OR CHANGE OIL IN THE FIELD AND THE RECOMMENDED OIL (OR EQUIVALENT) IS NOT AVAILABLE, AUTOMATIC TRANSMISSION FLUID TYPE "A", SUFFIX "A" MAY BE USED.



SECTION II

REPAIR PARTS

FOR

SELF-PROPELLED VIBRATORY ROLLERS

REGISTRATION NUMBERS UBOOFL TO UBOOHF

SP 848

NSN 3895-01-075-2823

INSTRUCTIONS FOR ORDERING PARTS

Order repair parts from your Rexnord distributor. Specify quantity, part number and name of part. Do not order by reference number or state quantity wanted in terms of sets or pairs.

Always give serial number of machine. This is very important. The serial number is stamped on manufacturers' plate which is attached to the frame of machine.

Be particular to give complete shipping address mentioning town, county and state. Also give billing instructions and address. Tell whether to ship via parcel post, express, air express or freight.

Index — Bulletin No. 480 (New Oct. 1977)
Model SP848 Self Propelled Vibratory Roller
Effective Serial No. 85HX505

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Battery		1
Controls		1
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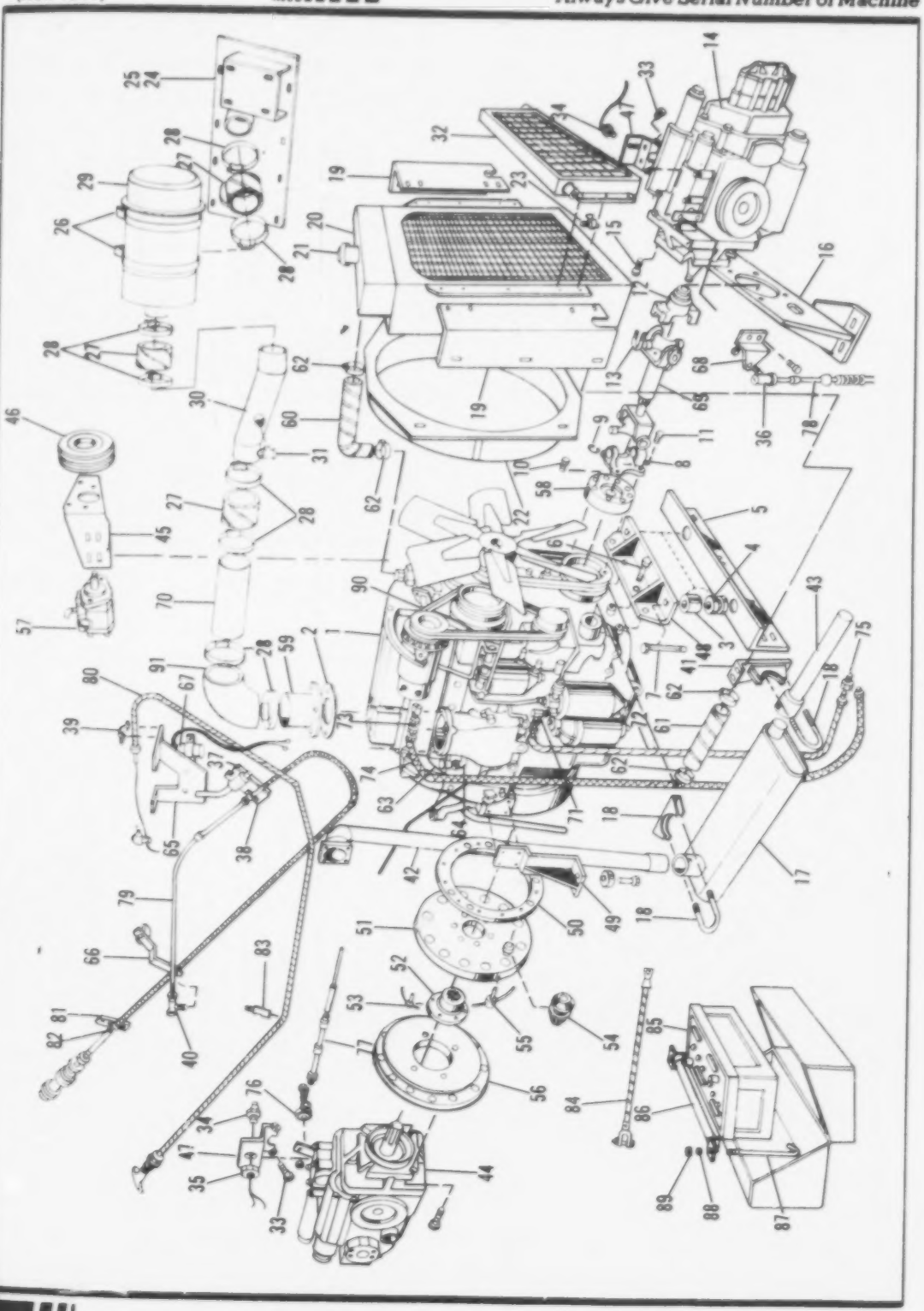
Always Give Serial Number of Machine

Rexnord Inc
Milwaukee, WI 53201

Always Give Serial Number of Machine



(C) FISCHE NO. 7 GRID D-1

POWER UNIT, AIR CLEANER MUFFLER — ENGINE MOUNTING, CONTROL CABLES, TRACTION AND VIBRATION HYDROSTATIC PUMPS AND DRIVES, POWER STEERING PUMP AND MOUNTING, BATTERY AND MOUNTING MODEL SP848 DIRT COMPACTING VIBRATORY ROLLER

EFFECTIVE SERIAL NO. 85HX505

Item No.	Part Number	Description	No. Req'd.
1	102-9906-1	G.M. Diesel Engine Series 3-53 Model 5033-7001 Including the Following Features (Listed for Convenience Only — (Always Refer to Option Plate on Valve Rocker Cover and to Engine Parts Book for Definite Identification)	1
	.....	Flywheel SAE #4 for use with Rockford 11TT Clutch	—
	.....	Flywheel Housing SAE #4	—
	.....	Governor, Variable Speed with Closed Linkage Set at 2450 RPM No Load	—
	.....	Fan - 18" Dia. Suction 5 Blade (6KI-469)	—
	.....		—
	.....	Air Inlet Housing for Remote Mounted Donaldson H.D. Air Cleaner	—
	.....	Lube Oil Filter, F.F. Mounted on Oil Cooler	—
	.....	Exhaust Manifold — Side Outlet (5146215)	—
	.....	Water Connections — Less Radiator Connection	—
	.....	Battery Charging Alternator 12 Volt — 42 Amp.	—
	.....	Starting Motor, 12 Volt Sprag Oil Pan, Shallow, for 10 Degree Operation	—
	.....	Oil Pan Dipstick, for 10 Degree Oil Pan	—
	.....	Breather, on Flywheel Housing	—
	.....	Plain Rocker Cover with Oil Filler on Side	—
	.....	Injectors N50	—
	.....	Exhaust Outlet Flange — 3" Pipe Threads	—
	.....	Oil Cooler — Engine Only	—
	.....	C. S. Pulley — 2 Groove — Cone Drive (5126687(6KIA-153)	—
	.....	Tachrometer Drive Mtd. on R.H. Balance Shaft When Viewing Engine from Flywheel End, 90°	—

Item No.	Part Number	Description	No. Req'd.
1	.....	Adapter, 1 to .500 Ratio	—
(Cont'd.)	.....	Air Inlet Housing Gasket 5124405	—
	.....	Emergency Shutdown 5186687 (Plate)	—
	.....	Pull to Stop Name Plate 5184255	—
	.....	Start Name Plate 1567238	—
2	.....	Gasket — Air Inlet Housing (General Motors Part No. 5124405)	1
3	102-9096-1	Spacer — Engine Front Support	2
4	298-5515-68	Rubber Engine Mount Center Bonded — for ½" Mounting Bolt 2" O.D. x 1⅜" Assembled Thickness, 1¼" Dia. Mounting Hole (Lord #J-6256-3)	4
5	502-4755-80	Front Engine Support	1
6	398-2002-33	Cap Screw ½ x 3" U.N.C.	2
7	398-2002-42	Cap Screw ½ x 5" U.N.C.	2
8	X203740	Flange Yoke — (Spicer 2-2-329)	1
9	X203741	Snap Ring (Spicer 2-7-29)	2
10	398-20000-27 398-2002-57	Cut Washer ⅝" Hex Head HC-HT Cap Screw ⅝ x 1¾"	4
11	298-41-93 398-20000-37	Cap Screw ⅜ x 1" — SAE Grade 8 Lock Washer ⅜"	4 4
12	102-9393-1 X8005	End Yoke (Dana #2-4-87-1) "U" Bolt	1 2
13	398-20000-64 398-11000-18	Lock Washer ⅝" Hex Nut ⅝" U.N.C.	4 4
14	102-9450-1	Sundstrand Model 22-2052 Hydrostatic Pump (Propulsion) — See Separate Illustration	1
15	398-2002-18 398-20000-25 398-20000-39	Cap Screw ½ x 1¼" U.N.C. Cut Washer ½" Lock Washer ½"	4 4 4
16	502-6316-80	Bracket — Propulsion Pump	1
17	298-5149-92	Exhaust Muffler (Nelson Muffler Corp. #T-14855)	1
18	298-205-47	Muffler Clamp — 3½" (Maremont Auto Products No. X 350)	3
19	502-8114-80	Radiator Mounting Bracket	2
20	102-6518-1	Radiator & Shroud	1
21	298-5177-92	Radiator Cap — (Included in Item 20)	1

POWER UNIT, AIR CLEANER MUFFLER — (Continued)
-ENGINE MOUNTING, CONTROL CABLES, TRACTION AND
VIBRATION HYDROSTATIC PUMPS AND DRIVES, POWER
STEERING PUMP AND MOUNTING, BATTERY AND MOUNTING
MODEL SP848 DIRT COMPACTING VIBRATORY ROLLER
EFFECTIVE SERIAL NO. 85HX505

Item No.	Part Number	Description	No. Req'd.
22	502-4765-80	Auxiliary Fan Shroud	1
23	298-20-98	Drain Cock (Imperial #201E)	1
24	*502-6328-80	Air Cleaner Bracket	1
25	X203699	Strip — Channel Rubber	1
26	*298-5126-92	Mounting Band — Air Cleaner — (Donaldson P4076)	2
27	102-9125-2	Air Cleaner Hose	3
28	298-9058-86	Hose Clamp	8
	*102-9209-1	Air Cleaner — (Donaldson Cyclopac FW Series Model FWG10-003)	1
	102-9209-2	Element for Air Cleaner (P11-8159)	1
29	102-9209-3	Gasket Washer for Air Cleaner — (Donaldson Part No. P18462)	1
	102-9209-4	Cup Gasket for Air Cleaner — (Donaldson Part No. P10-1401)	1
30	*502-4850-80	Tube — Air Cleaner	1
31	298-6509-68	Indicator — Air Filter — 1/8 x 1/8 Connector Fitting with Built in Safety Filter (Bacharach Code No. 63-0039 Model 63-7001)	1
32	298-5054-92	Oil Cooler (Yates #RD-L-6556, General Radiator Inc. #OC-2409, Perfex #A18-953 or Equal)	1
33	398-17000-70	Square Head Set Screw 3/8" x 1½"	4
	398-11000-19	Hex Nut 3/8"	8
34	298-6085-17	Neutral Stop Switch (Cole-Herse #9233)	2
35	102-6973-1	Nut — Neutral Stop Switch	2
36	X202821	Ball Joint ¼" (Tourek Type SR No. SR107G)	1
37	298-157-47	Bracket — Cable Clamp — (Morse #A21600)	2
38	298-158-47	Cable Clamp ½" for 43C Series Cable (Morse #A21227)	2
	398-10000-48	Rd. Hd. Mach. Screw 10-24 x ¾"	4

Item No.	Part Number	Description	No. Req'd.
	298-146-47	Cable Clamp 1" Hole Centers 2-13/64 Dia. Holes for 30 Series	
39		Cable (Morse #A31804)	1
	398-10000-46	Rd. Hd. Mach. Screw #10-24 x 5/8"	2
	398-11000-16	Hex Heavy Nut #10-24	6
40	298-263-47	Cable End 10 — 32 UNF Female — ¼ - 28 Male (Morse A31126)	1
41	102-30528-1	Bracket — Muffler Support	1
42	502-6494-80	Pipe — Down Exhaust	1
43	298-5154-92	Exhaust Extension — (Stemco Mfg. Co. #27-10257)	1
	102-8704-1	Vibratory Hydrostatic Pump — Model 22-2031 —	1
44			1
45	102-4786-1	Bracket — Steering Pump	1
46	102-30614-1	Sheave — Steering Pump	1
47	502-2157-80	Lever — Stop	2
48	502-4399-80	Front Engine Support	1
	398-2002-5	Cap Screw 7/16 x 1¼" U.N.C.	2
	502-4257-81	Rear Engine Support (R.H.) — (Opposite of Illustration)	1
49	502-4257-80	Left Rear Engine Support — (As Illustrated)	1
	398-2002-21	Cap Screw ½ x 1½" U.N.C.	8
	398-20000-39	Lock Washer ½"	8
50	102-3283-1	Adapter	1
	398-2006-65	Socket Head Nylock Cap Screw ⅜ x 1¼" (Heat Treated)	6
51	102-5164-1	Drive Plate	1

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Raymond
Raymond Inc.
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POWER UNIT, AIR CLEANER MUFFLER — (Continued)
ENGINE MOUNTING, CONTROL CABLES, TRACTION AND VIBRATION HYDROSTATIC PUMPS AND DRIVES, POWER STEERING PUMP AND MOUNTING, BATTERY AND MOUNTING
MODEL SP848 DIRT COMPACTING VIBRATORY ROLLER
EFFECTIVE SERIAL NO. 85HX505

Item No.	Part Number	Description	No. Req'd.
52	402-624-2	Hub	1
53	102-7362-1	Drilled Cap Screw 5/16 x 3/4" — HC-HT	6
	398-20000-64	Lock Washer 5/16"	6
54	102-7361-1	Joint — Center Bonded — (Lord #JA-6250-1)	12
55	102-7360-1	Drilled Cap Screw — 5/16 x 1 3/4 HT-HC	12
	102-3666-1	Adapter Plate — Hydraulic Pump	1
	398-2002-22	H.T. Cap Screw 1/2 x 1 1/2" U.N.C.	4
	398-20001-13	Cut Washer 1/2" S.A.E.	4
	398-2001-76	Cap Screw 3/8 x 1" U.N.C.	7
56	398-2002-31	Cap Screw 1/2 x 2 1/2" U.N.C.	1
	398-2002-24	Cap Screw 1/2 x 1 3/4" U.N.C.	2
	398-20000-25	Cut Washer 1/2"	3
	298-2010-71	Self Locking Nut 1/2 - 13 U.N.C. (McLean - Fogg - Uni - Torque)	3
57	102-7949-1	Hydraulic Pump — Steering — Constant Displacement — Vane Type — 7.5 GPM — 1500 PSI Relief — Manifold Type — R.H. Rotation (Vickers #VTM 42-60-75-15-MD-R1-14) See Separate Illustration	1
	102-3680-1	Flange — Yoke Adapter	1
58	398-2006-23	Socket Head Nylok Cap Screw 5/16 x 1" (Secure with "Loctite Nut Lock")	4
59	502-8128-80	Air Intake Adapter Tube	1
	398-2001-58	Hex Hd. Cap Screw 5/16 x 3/4"	1
60	102-9120-1	Radiator Hose — Upper 1 3/4" I.D.	1
61	298-5701-68	Radiator Hose — 2" I.D. — Flexible 13" Overall (General #218 or Equal)	1
62	298-9027-86	Hose Clamp 1 13/16 to 2 3/4" (Breeze #QS100 M36 or Equal)	4
63	298-92-47	Either Cup (63/64 Cup Dia., 1/8 - 27 NPT, 1 15/16 Overall Height, Spring Loaded Cover (Gits #1003-S28)	1
64	398-14001-28	Street Elbow 1/8 x 90°	*1
65	502-4625-80	Bracket — Throttle and Governor Pull to Stop Cables	1
66	502-2980-80	Control Arm — Governor Throttle	1
67	298-6543-17	Solenoid Switch 12 Volt — Grounded (Cole - Hersee #24037) Ignition	1
68	502-8113-80	Lever — Pump Control	1
69	291251-48	"U" Joint	1
70	102-10186-1	Air Intake Tube	1
71	298-2071-62	Adapter — Union 1/4" Male NPT x 1/4" Female — 90° (Anchor #4MA-4UFS)	1
72	502-1341-90	Fuel Line (Suction) 6 ft. lg.	1
73	398-14000-13	Outside Hex Mall — Pipe Bushing 1/2 x 3/8"	1
74	502-2786-80	Hose Assembly — Return Fuel Line	1
75	398-14000-5	Outside Hex Bushing 3/8 x 1/4"	2
76	298-276-2	Rod End — Female — 1/4" Bore — 1/4 - 28 NF Thread	1
	102-8672-6	Control Cable — Vibration Pump (Morse 43BC114) 114" lg. — Model 848 only (as illustrated)	1
77			1
78	102-7554-5	Control Cable — Direction (Morse Part No. 43B168)	1
79	102-8642-4	Throttle Control Cable — 30M Series Vernier Control (18 Turns) Black Knobs Control and Brake, Part No. D44194, Clamp Type — Threaded End 10-32NF-3 with Boot #A45477	1
80	102-7957-1	"Pull to Stop" Cable (Morse B48701 Cable with B42978-1A Red "T" Handle)	1
81	102-8022-1	Cable Mount (Emergency Stop)	1

POWER UNIT, AIR CLEANER MUFFLER — (Continued)
ENGINE MOUNTING, CONTROL CABLES, TRACTION AND VIBRATION HYDROSTATIC PUMPS AND DRIVES, POWER STEERING PUMP AND MOUNTING, BATTERY AND MOUNTING
MODEL SP848 DIRT COMPACTING VIBRATORY ROLLER
EFFECTIVE SERIAL NO. 85HX505

Item No.	Part Number	Description	No. Req'd.
82	102-7958-1	Clamp — Cable	1
83	102-7253-1	Cable Brake (Morse A44386, Series 60)	3
84	102-8523-1	Battery Cable 73" Long	1
	102-8523-2	Battery Cable — 30" Long	1
85	298-3255-17	Battery — Diesel Starting — 12 Volt AABM Group Size 4D — Delco #759 or Exide D-4D-4939 or Equal)	1
86	502-2693-80	Clamp — Battery	1
87	102-7766-1	Bolt — Battery Hold Down	2
88	398-20000-37	Lock Washer 3/8"	2
89	298-2012-71	Nut 3/8"	2
90	298-7036-91	"V" Belt — Fan & Steering Pump (Maurey A48)	1
91	298-5092-92	Air Cleaner Elbow (Rubber — 90°)	1

(C) FISCHE NO. 7 GRID D-5

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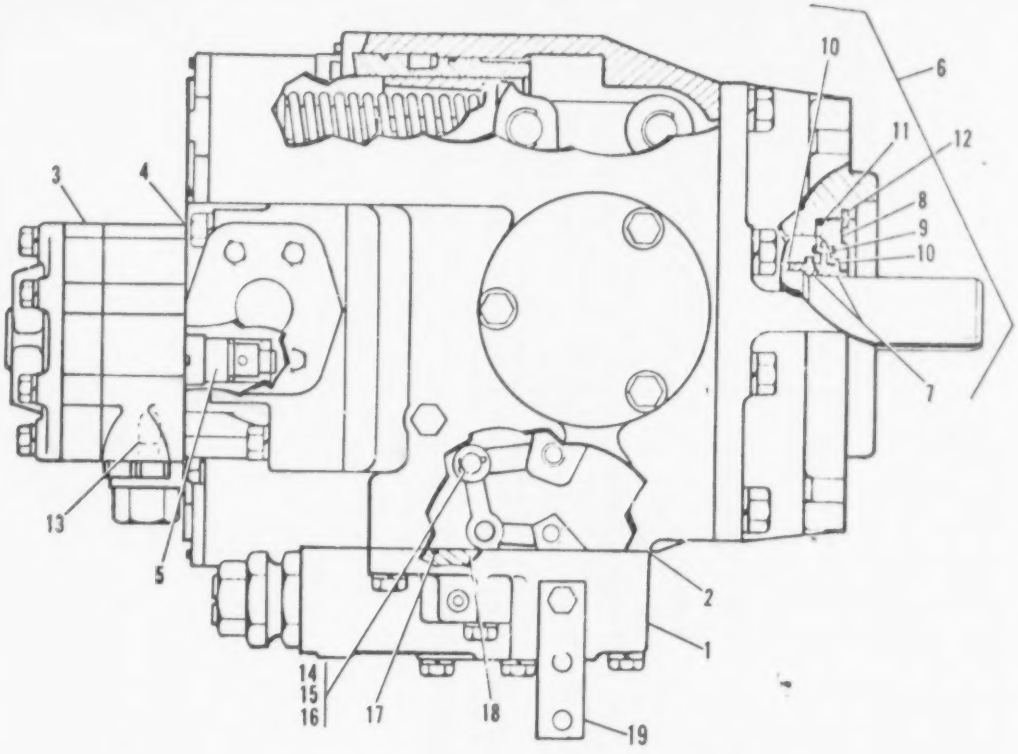


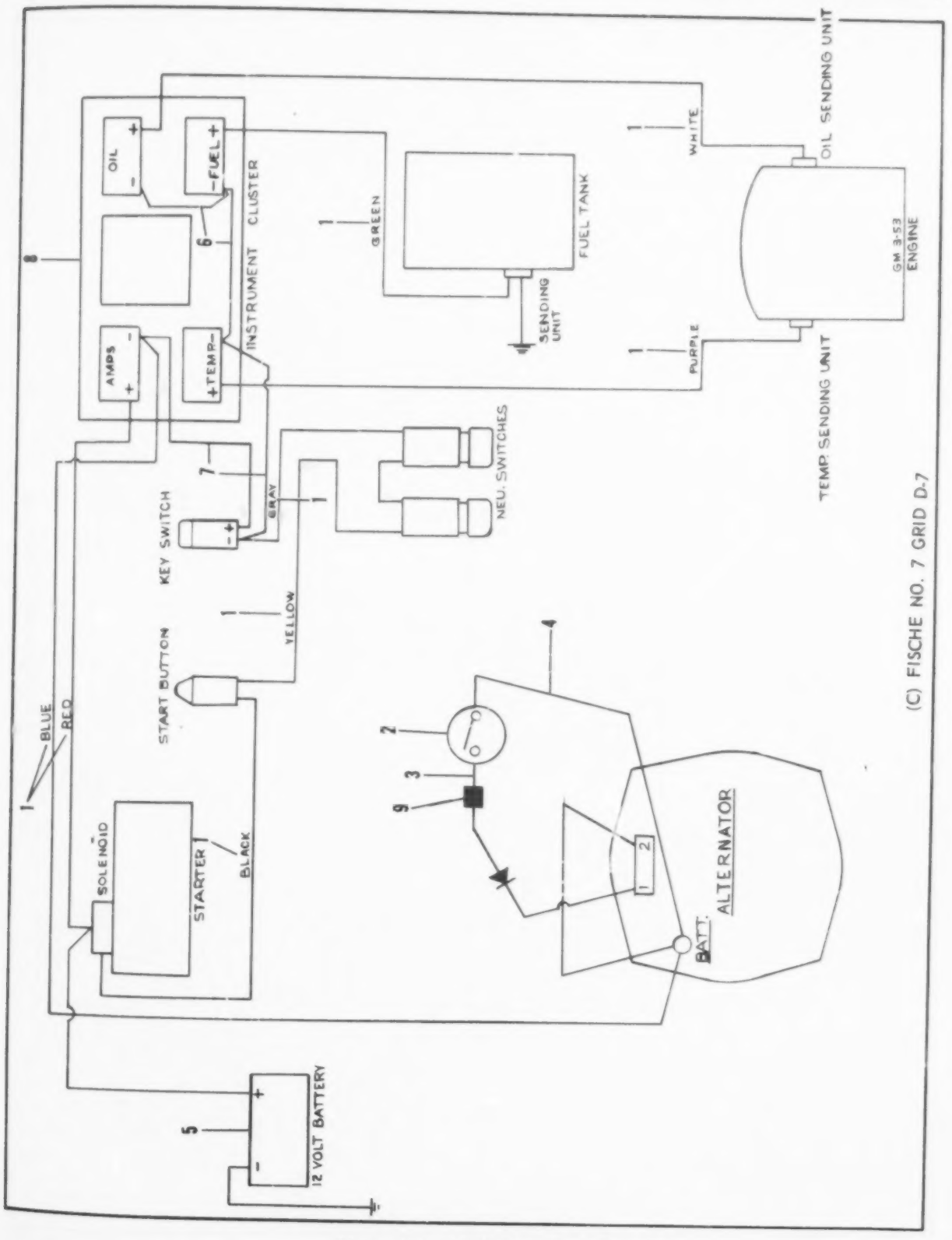
HYDROSTATIC PUMP — TRACTION DRIVE
SUNDSTRAND MODEL NO. 22-2124
REX PART NUMBER 102-9450-1
MODEL SP848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	102-4365-4	Control Valve	1
2	102-4365-6	Gasket — Control Valve	1
3	102-4365-7	Charge Pump	1
4	102-4365-11	Gasket — Charge Pump	1
5	102-4365-12	Check Valve	1
6	102-4365-1	Seal Kit (Contains Items 7 thru 11 — Not Sold Separately)	1
7	.....	Shaft Seal	1
8	.....	Housing Seal	1
9	.....	Seal Spring	6
10	.....	"O" Ring	2
11	.....	"O" Ring	1
12	102-4365-47	Retaining Ring	3
13	102-4365-52	Charge Pump Relief Valve Poppet	1
14	102-4365-48	Cotter Pin	1
15	.....	Reference Only — (Pin)	1
16	102-4365-50	Washer	1
17	.....	Reference Only — (Orifice)	—
18	102-4365-51	"O" Ring	3
19	102-4365-46	Control Shaft Handle	1

Note — Do not attempt repairs beyond parts listed aboye — Rebuilt — fully warranted pumps and motors are available from stock at special exchange prices.

(C) FISCHE NO. 7 GRID D-6

Rex construction machinery



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WIRING DIAGRAM — NEGATIVE GROUND ALTERNATOR

MODEL SP848 SELF PROPELLED VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	102-30507-1	Wire Set	1
2	298-6540-17	Field Switch	1
3	102-9790-1	Wire	1
4	102-9791-1	Wire	1
5	298-3255-17	Battery — 170 Amp.	1
6	203027-1	Wire	2
7	203027-2	Wire	2
8	102-4375-1	Instrument Cluster	1
9	298-86-17	Connector	1

(C) FISCHE NO. 7 GRID D-8

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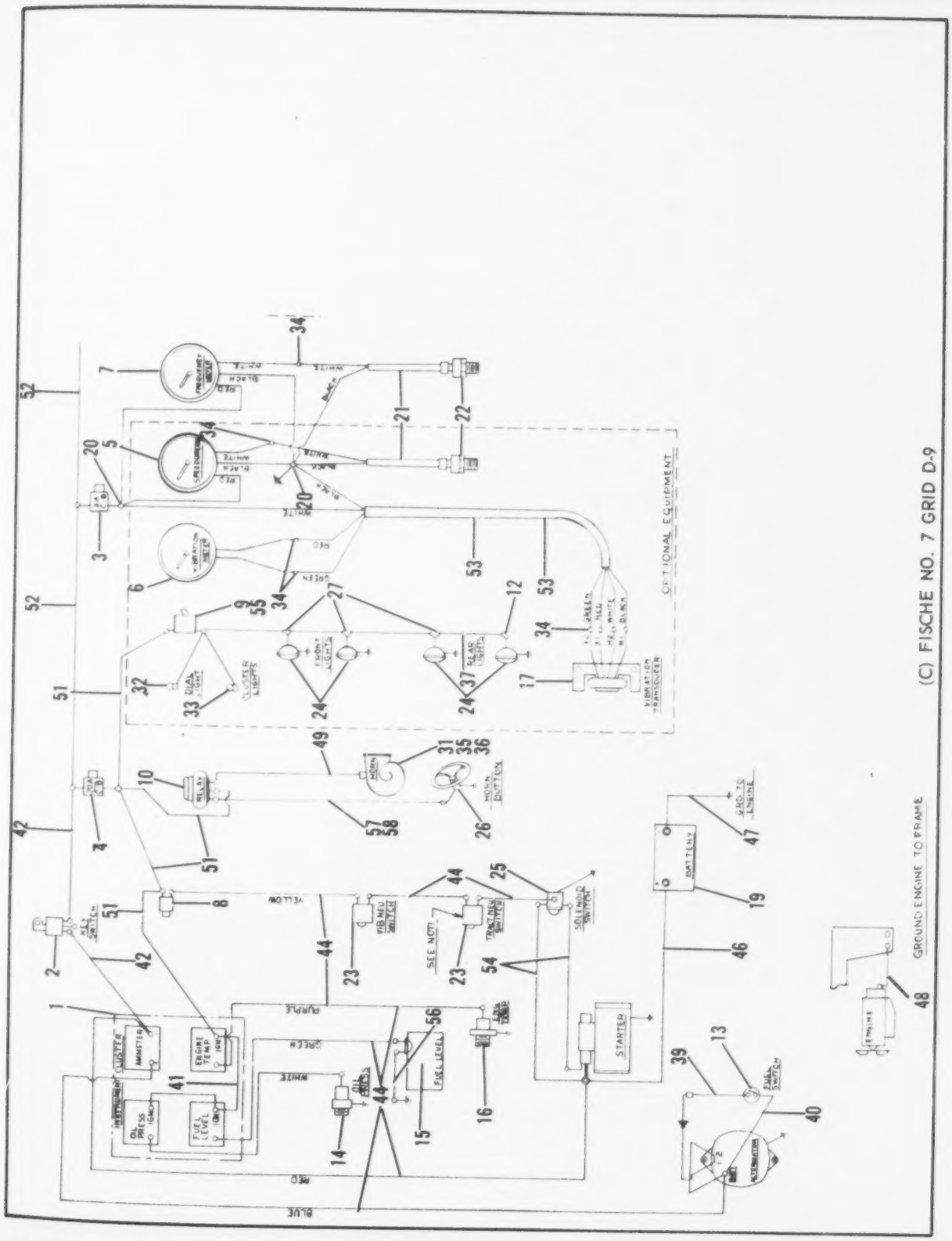
Rex construction machinery



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WIRING DIAGRAM
MODEL SP848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	102-4375-1	Instrument Cluster	1
2	298-6176-17	Key Switch	1
3	298-5004-17	2 Amp Circuit Breaker	1
4	298-5005-17	20 Amp Circuit Breaker	2
5	102-9893-1	Speedometer	1
6	102-9892-1	Vibration Meter	1
7	102-8743-1	Frequency Meter	1
8	298-6067-17	Start Button	1
9	298-6123-17	Toggle Switch	4
10	298-15018-17	Horn Relay	1
11	298-26085-17	Bullet Terminal	1
12	298-26086-17	Connector — 2 Wire Bullet	2
13	298-6540-17	Pressure Switch (Fuel)	1
14	298-2066-56	Oil Press. Sending Unit	1
15	298-2083-56	Fuel Sending Unit	1
16	298-2067-56	Temp. Sending Unit	1
17	602-3145	Vibration Transducer	1
18	X8189	Wire Terminal — For ⅜ Bolt.	1
19	298-3255-17	Battery (Standard)	1
	298-3256-17	Battery (Cold Start)	1
20	298-26026-17	Wire Terminal For #10 Stud	8
21	502-205-80	Cord Assy.	2
22	298-103-17	Frequency Pick-up	2
23	298-6085-17	Neutral Start Switch	2
24	298-12015-17	Flood Lamps	4
25	298-6543-17	Solenoid Switch (IGN)	1
26	102-9148-1	Horn Button Kit	2
27	298-26087-17	Connector — 3 Wire Bullet	3
28	298-46-98	Solenoid Switch (o/c Wet)	1
29	298-6524-17	Limit Switch	1
30	102-6440-1	Pump (See Separate Illustration)	2

Item No.	Part Number	Description	No. Req'd.
31	102-9149-2	Horn	1
32	298-136-17	Dial Light	3
33	298-13162-17	Light Kit (Instrument Cluster)	2
34	298-86-17	Connector — Solderless	10
35	102-9149-3	Nut — Bracket	1
36	102-9149-4	Bracket — Horn	1
37	102-30523-1	Wire Set	1
38	298-26034-17	Wire Terminal For ¼ Stud	2
39	102-9790-1	Wire 1 ft. 0" lg.	1
40	102-9791-1	Wire 1 ft. 3" lg.	1
41	203027-1	Wire	2
42	102-30527-1	Wire 1 ft. 0" lg.	2
43	102-30503-1	Wire Set	1
44	102-30507-1	Wire Set	1
45	.....	Not Used	—
46	102-8523-1	Battery Cable 6 ft. 1 in. long (SP848 only)	1
47	102-8523-1	Battery Cable 6 ft. 1" lg. (SP900 only)	1
	102-8523-2	Battery Cable 2 ft. 6" lg. (SP848 only)	1
48	298-26040-17	Battery Cable 1 ft. 7" lg.	1
49	102-30524-2	Wire 3 ft. 4" lg.	1
50	102-30525-2	Wire 3 ft. 6" lg.	2
51	102-30526-1	Wire 1 ft. 0" lg.	5
52	102-30526-3	Wire 3 in. lg.	1
53	102-9291-2	Wire (SO #14-4) 15'0" lg.	1
54	102-9859-1	Wire Set 1 ft. 6" lg.	1
55	298-52-17	Seal for Toggle Switch	4
56	502-2829-80	Wire 1 ft. 8" lg.	1
57	102-30673-1	Wire — 14 Ga. 2 ft. 6" lg.	1
58	102-30525-1	Wire — 14 Ga. 1 ft. 3" lg.	1

(C) FISCHE NO. 7 GRID D-10

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Rexnord

Rexnord Inc.
Milwaukee, WI 53201

480-10
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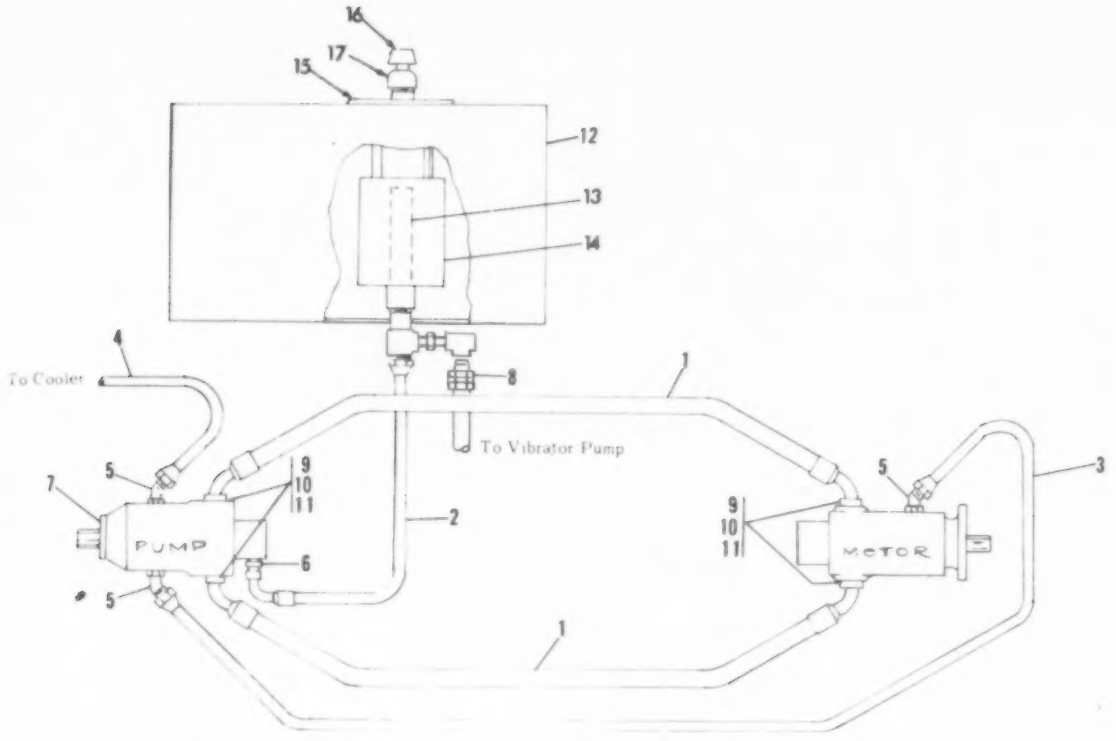
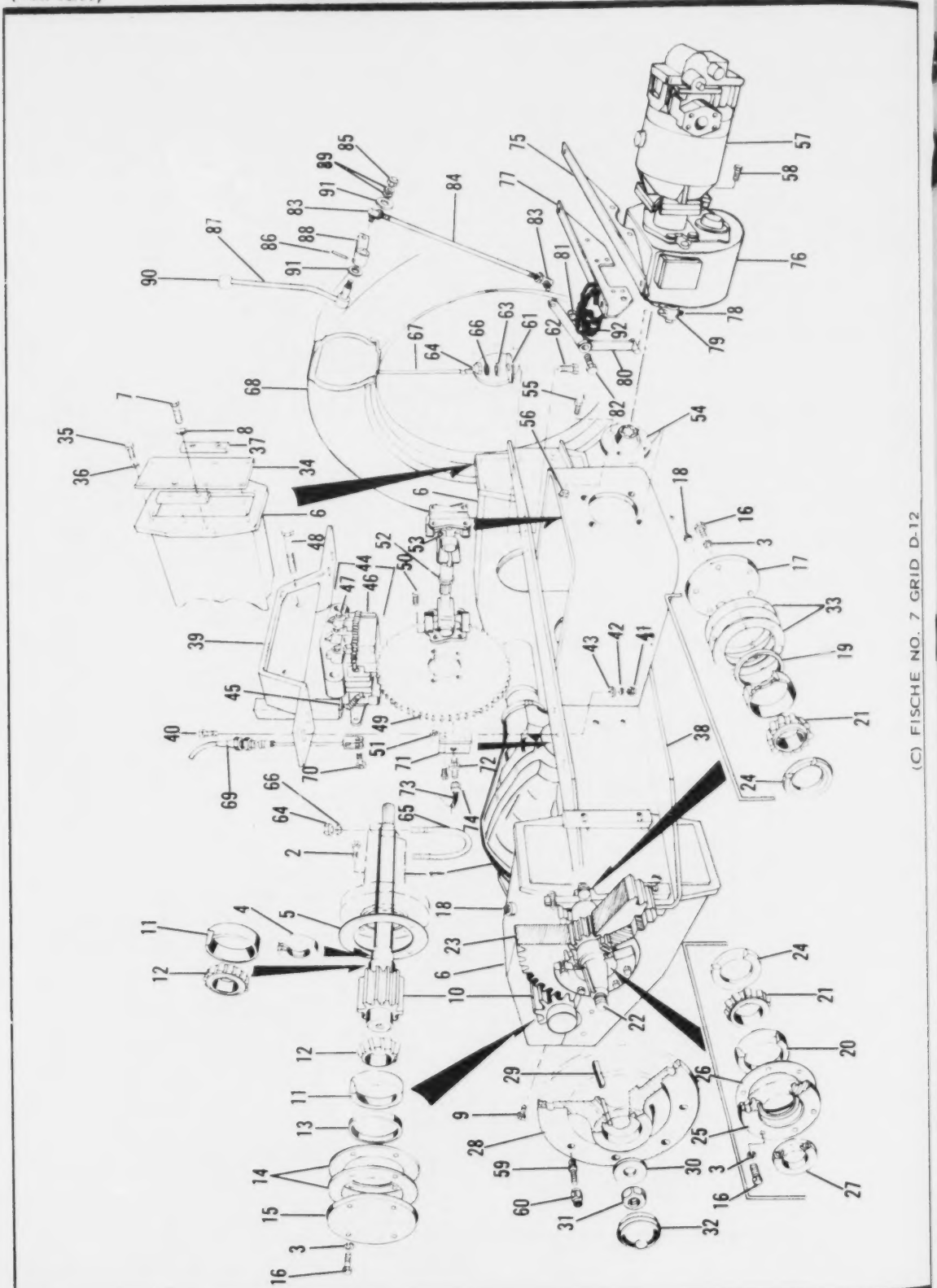


Item No.	Part Number	Description	No. Req'd.
1	102-03691-03	Hose Assembly, 1" SAE x 42½" Lg.	2
2	102-03688-02	Hose Assembly, ¾" NPT to 1⅞₆" JIC x 82" Lg.	1
3	502-02783-81	Hose Assembly, ⅞" JIC x 42" Lg.	1
4	502-08005-80	Hose Assembly, ½" NPT to ⅞" JIC x 20" Lg.	1
5	298-08118-86	Elbow ¾" x 45°	3
6	298-08078-86	Straight Adapter, ⅞" NPT to 1⅞₆" JIC	1
7	102-9450-1	Hydraulic Pump, Traction (See Contents)	1
8	102-03849-03	Hose Assembly, ¾" NPT x 30" Lg.	1
9	102-01594-04	"O" Ring, 1⅞₆" I.D. x 1⅞₆" O.D.	4
10	298-08033-86	Split Flange Clamp 1"	8
11	398-02005-56	Cap Screw ⅜" x 1¼"	16
12	602-10051-01	Hydraulic Tank, incls. the following:	1
	102-08418-01	Plate, Cover	1
	102-07864-01	Gasket, Cover	1
	398-14000-91	Pipe Cap, 1"	1
	398-14000-89	Pipe Cap, ¾"	1
	398-14006-19	Pipe Cap, ½"	2
13	102-08510-01	Tube, Hydraulic Tank	1
14	298-00133-53	Element, Filter	2
15	502-02733-80	Cover, Hydraulic Tank	1
16	102-07320-01	Cap, Filler	1
17	298-8001-89	Breather	1

June '73

Rexnord
Rexnord Inc
Milwaukee, WI 53201



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Item No.	Part Number	Description	No. Req'd.
1	502-6475-80	Differential Assembly — Reference Only — See Separate Illustration	1
2	398-2002-28	H.T. Cap Screw ½ x 2"	8
3	398-20000-39	Lock Washer ½"	44
4	298-3115-68	Oil Seal (National 410082)	2
5	58183-20	Shim (.020" thick)	2
6	502-6457-80	Gear Box	2
7	398-2005-37	H.T. Cap Screw ¾ x 2"	8
8	298-36-97	Hardened Washer ¾"	8
9	398-2002-89	Cap Screw ¾ x 1"	4
10	402-4803-1	Shaft — Pinion Gear	2
11	298-349-2	Bearing Cup (timken No. 28622)	4
12	298-350-2	Bearing Cone (timken No. 28678)	4
13	102-9822-1	Spacer	2
14	58183-5	Shim (.005") as required	6
	58183-7	Shim (.007") as required	6
	58183-20	Shim (.020") as required	4
15	102-30479-1	Cover	2
16	398-2002-25	H.T. Cap Screw ½ x 1¾"	32
17	502-8343-80	Cover with Oil Level Hole	2
18	398-14005-76	Square Hd. Pipe Plug ¾"	6
19	102-9798-1	Spacer	2
20	298-351-2	Bearing Cup (timken JM714210)	4
21	298-352-2	Bearing Cone (timken JM714249)	4
22	102-4780-1	Axle Shaft	2
23	402-2639-2	Gear — 43 Teeth	2
24	102-9800-1	Spacer	4
25	102-30455-1	Retainer — Bearing	2
26	58486-20	Shim (.020")	2
27	298-3114-68	Oil Seal (National 415011)	2
28	402-1768-2	Wheel Hub	2
29	398-6001-87	Straight Key ⅝ x ⅝ x 2½"	2
30	102-9802-1	Washer	2
31	398-11001-89	Lock Nut 1½" — 12 NF — 3	2
32	298-4006-47	Hub Cap	2
33	58486-5	Shim (.005") as req'd.	10
	58486-7	Shim (.0075") as req'd.	6
	58486-20	Shim (.020") as req'd.	6
34	102-30459-1	Cover — Gear Box	2
35	398-2001-77	H.T. Cap Screw ⅜ x 1"	16
36	398-20000-37	Lock Washer ⅜"	16
37	102-9816-1	Spacer	4
38	502-6459-80	Strut — Gear Box & Motor Mount	1
39	502-4986-80	Support — Disc Brake	1
40	398-2002-57	H.T. Cap Screw ⅝ x 1¾"	4
41	398-11000-23	Nut ⅝"	4
42	398-20000-41	Lock Washer ⅝"	4
43	398-20000-27	Cut Washer ⅝"	4
44	102-9726-1	Disc Brake Mechanical Caliper (H. H. Products No. 00-04270) Consisting of items 45-46 & 47	1
45	102-9726-10	Cam Side Subassembly (H. H. Products No. 99-04306) Consisting of:	1
	102-9726-11	Pix (H. H. Products No. 33-04305)	1
	102-9726-12	Cam Side Housing (H. H. Products No. 99-02564)	1
	102-9726-13	Pad Holder (H. H. Products No. 99-06212) includes Friction Material and Pad Holder Assembled	1
	102-9726-20	Friction Material (566 sintered) (H. H. Products No. 57-00306)	1
	102-9726-14	Spring — Pad Retainer (H. H. Products No. 06-03356)	1
	102-9726-15	Pin, Push (H. H. Products No. 05-05790)	2
	102-9726-16	Cam (H. H. Products No. 18-02918)	1
	102-9726-17	Washer (H. H. Products No. 03-02772)	1
	102-9726-18	Jam Nut (H. H. Products No. 66-04953)	2
	102-9726-19	Cotter Pin (H. H. Products No. 05-04167)	2
46	102-9726-21	Carrier Side Subassembly (H. H. Products No. 99-06214) Consisting of:	1

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TRACTION DRIVE TRAIN AND AXLE MOUNTING — (Continued)
MODEL SP848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
46 (Cont'd.)	102-9726-22	Pix (H. H. Products No. 33-04307)	1
	102-9726-23	Carrier Side Housing (H. H. Products No. 12-02544)	1
	102-9726-13	Pad Holder (H. H. Products No. 99-06212) includes Friction Material and Pad Holder Assembled	1
	102-9726-20	Friction Material (566 sintered) (H. H. Products No. 57-00306)	1
	102-9726-14	Spring — Pad Retainer (H. H. Products No. 06-03356)	1
	102-9726-19	Cotter Pin (H. H. Products No. 05-04167)	2
47	102-9726-24	Ferry Hd. Cap Screw ½-13 x 3" long (H. H. Products No. 66-04540)	3
48	298-90-93	Cap Screw 5/8 x 5½" GRD.#8	2
	298-2059-71	Lock Nut 5/8"	2
49	102-30533-1	Disc — Brake, Speedometer	1
50	398-2005-20	H.T. Cap Screw 7/16 x 1¾"	4
51	398-11000-21	Nut 7/16"	4
	398-20000-38	Lock Washer 7/16"	
52	298-6075-91	"U" Joint Assembly (Dana 9012-SF)	1
53	102-7322-10	Journal & Bearing Kit — (included in item 52)	2
54	298-6076-91	Companion Flange	1
55	398-2004-83	H.T. Cap Screw 7/16 x 1¼"	4
56	398-20000-38	Lock Washer 7/16"	4
	398-11000-21	Hex Nut — 7/16"	
57	102-8506-1	Hydrostatic Motor — (Sundstrand Model 22-3055)	1
58	398-2005-88	Nylok H.T. Cap Screw ½ x 1¾"	4
	398-20001-13	S.A.E. Cut Washer ½"	4
59	298-4037-47	Wheel Stud (Motor Wheel Co. No. 83589) (Electric Wheel Co. No. FS15262) (Budd No. 43806)	16
60	298-5-71	Nut — ¾-16 NF (Budd No. 37888)	16
61	102-9803-1	Shim (22 Gauge) — as required	6
	102-9803-2	Shim (18 Gauge) — as required	6
	102-9803-3	Shim (12 Gauge) — as required	6
62	398-2004-31	H.T. Cap Screw ¾ x 2¼"	2
63	398-20000-28	Cut Washer ¾"	2
64	298-2035-71	Lock Nut ¾" UNC	6
65	102-9804-1	"U" Bolt ¾"	2
66	398-20000-42	Lock Washer ¾"	6
67	502-6473-80	Wheel (Model 850 only)	2
			2
68	298-6014-68	Optional 18:00 x 26 All Weather Tire (Model 850 Only)	2
			2
69			1
	102-30477-1	Emergency Parking Brake Cable	1
70	298-129-47	Clevis Pin	1
71	102-9917-1	Bracket — Speedometer Pick-up	1
72	298-103-17	Magnetic Pick-up — Speedometer	1
73	502-205-80	Cord Assembly	1
74	298-26031-17	Connector	1
75	102-30484-1	Support — Motor Adaptor	1
76	602-8409-1	Transmission Assembly — Reference Only — See Separate Illustration	1
77	502-4988-80	Support — Transmission	1
78	102-7287-1	Screw (Shift Yoke Block)	1
	398-99012-90	Wire .045 Dia., SAE 51430	1
79	402-649-2	Shift Block	1
80	502-4972-80	Lever — Shift Block	1
81	298-2035-71	Nut	1
82	398-2004-64	HC. HT. Hex Head Cap Screw ¾ x 3"	2
83	X7733	Ball Joint	4
	398-11000-41	Hex Nut ½" U.N.F.	2
	398-20000-39	Lock Washer ½"	1
84	102-9727-1	Shift Rod	1
85	298-2042-71	Nut	1
86	298-6000-34	Rollpin 5/16 x 1¾"	1
87	502-8323-80	Shift Lever	1
88	502-8322-80	Arm — Shift Lever	2
89	298-37-97	Washer	1
90	X204135	Ball	2
91	398-20000-28	Cut Washer ¾"	1
92	502-8455-80	Bracket for Shift Block	

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Rexnord
Rexnord Inc.
Milwaukee, WI 53201
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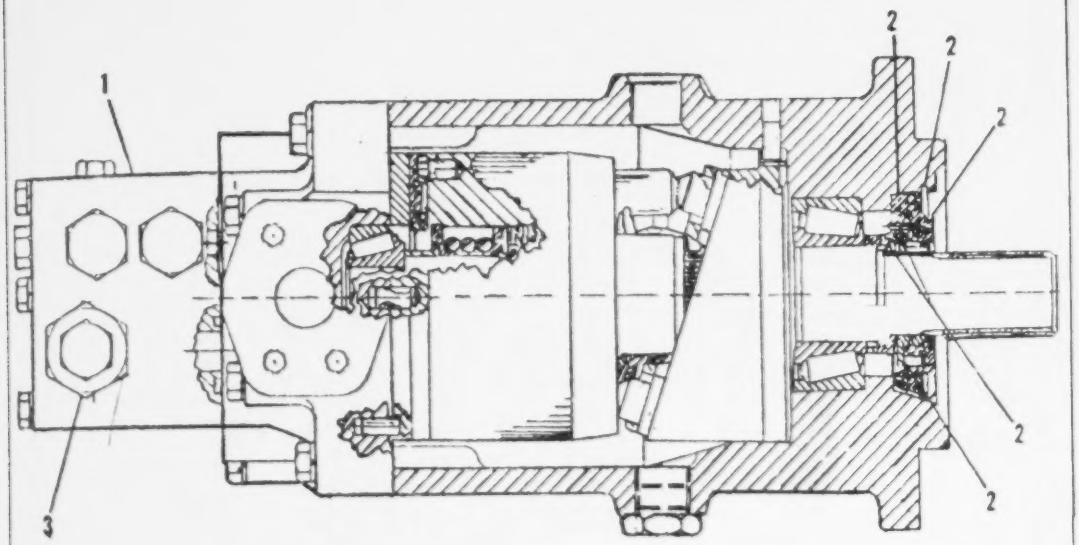
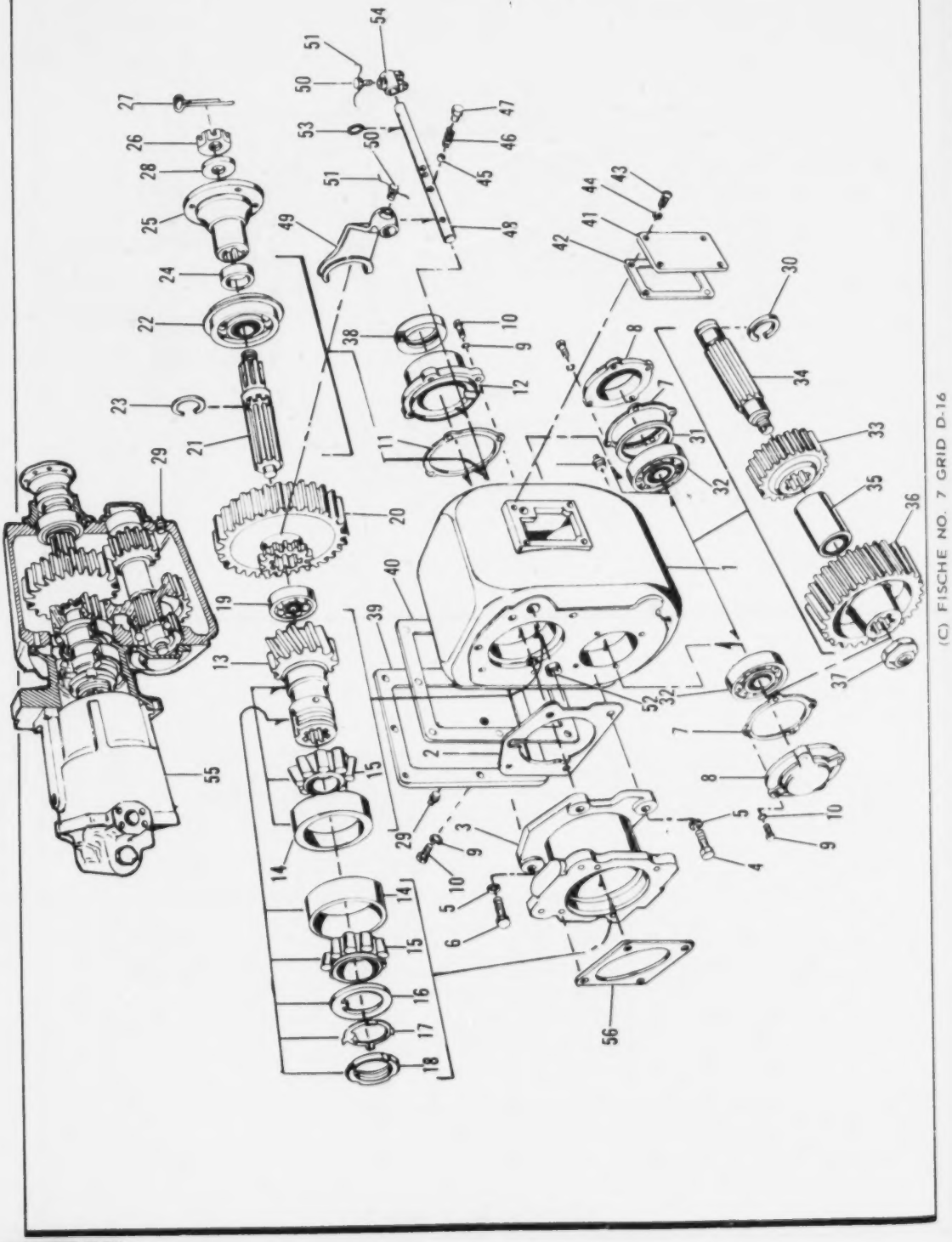


FIXED DISPLACEMENT HYDROSTATIC MOTOR SERVICE PARTS
REX PART NUMBER 102-8506-1 (SUNDSTRAND SERIES 22-3055)
REX PART NUMBER 102-6123-1 (SUNDSTRAND SERIES 23-3008)
MODEL 848 VIBRATORY ROLL TRACTION DRIVE

Item No.	Part Number	Description	No. Req'd.
1	102-4365-78	Manifold Assembly (Series 22 only)	1
	102-4365-14	Manifold Assembly (Series 23 only)	1
2	102-4365-1	Seal Kit (Series 22 only)	1
	102-4365-2	Seal Kit (Series 23 only)	1
3	102-4365-21	Relief Valve Assembly (Series 23 only)	1
	102-4365-77	Relief Valve Assembly (Series 22 only)	1
	NOTE: Rebuilt - fully warranteed pumps and motors are available from stock at special exchange price.		

(C) FISCHE NO. 7 GRID D-15

Rexnord Inc
Milwaukee WI 53201



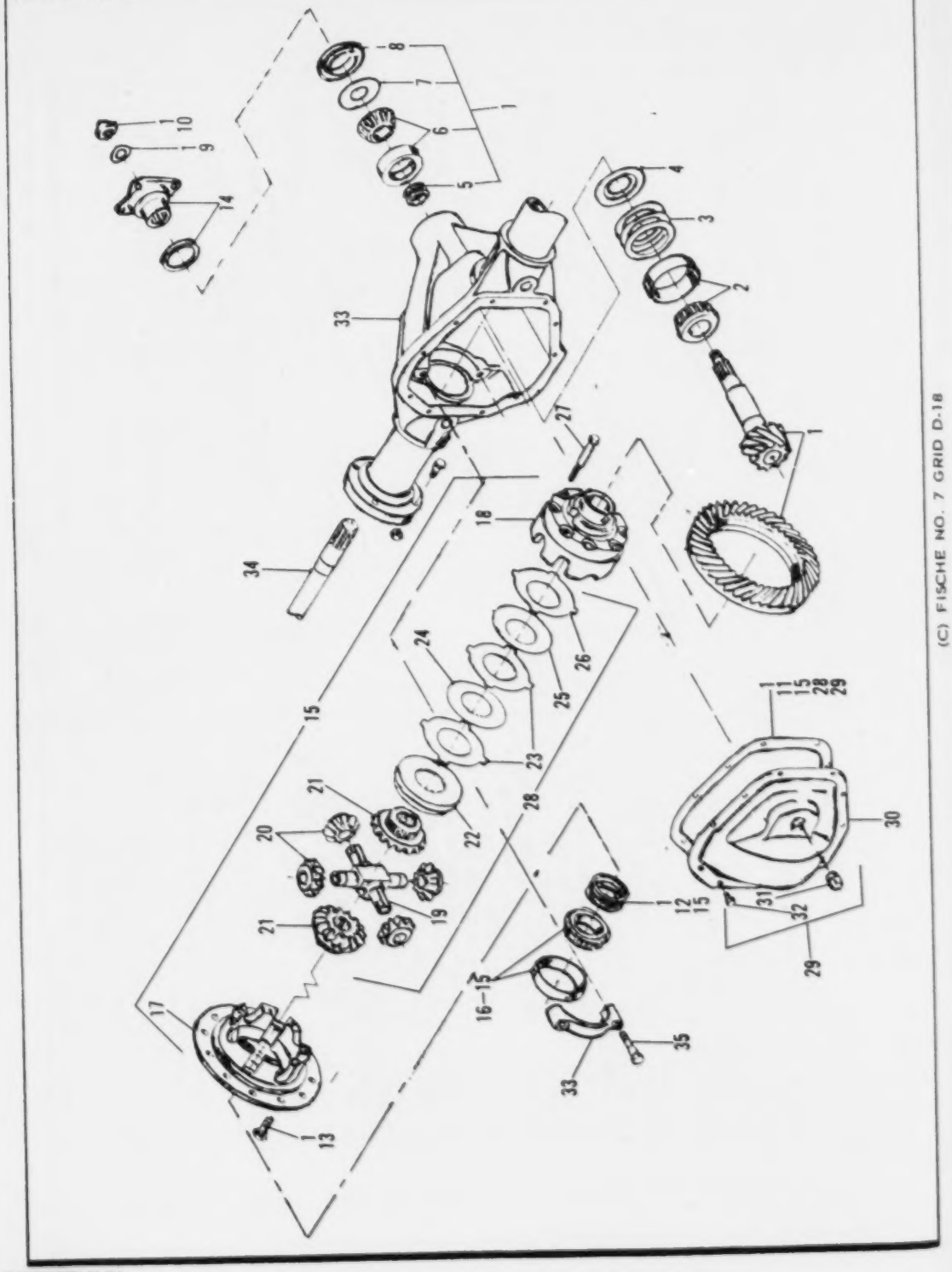
TRACTION DRIVE TWO SPEED TRANSMISSION
ASSEMBLY PART NO. 602-8409-1
USED ON SP848 VIBRATORY ROLLERS

No. Item	Part Number	Description	No. Req'd.
1	402-2596-8	Transmission Case	1
2	102-30411-1	Gasket	1
3	402-2621-2	Adapter	1
4	398-2002-56	Cap Screw 5/8 x 1 3/4" U.N.C.	2
5	398-20000-41	Lock Washer 5/8"	4
6	398-2002-60	Cap Screw 5/8 x 2" — Heat Treated, U.N.C.	2
7	102-3368-1	Gasket — Countershaft Bearing Cover	2
8	402-650-2	Cover — Countershaft Bearing	2
9	398-2001-77	Heat Treated Cap Screw 3/8 x 1"	20
10	398-20000-37	Lock Washer 3/8"	20
11	102-3370-1	Gasket — Rear Bearing Cover	1
12	402-646-2	Cover — Rear Bearing	1
13	102-4818-1	Main Drive Gear	1
14	298-344-2	Bearing Cone (Timken #397) — 2.3622" I.D., .8660" Wide	2
15	298-45-2	Tapered Roller Bearing Cup (Timken #394A)	2
16	298-10032-2	Keyed Washer (Timken #K91512)	1
17	298-10030-2	Lock Washer (Timken #TW112)	1
18	298-10031-2	Lock Nut (Timken #TN12)	1
19	298-253-2	Ball Bearing (N.D. #1206)	1
20	102-4817-1	Gear — Mainshaft Sliding	1
21	102-4428-1	Mainshaft	1
22	298-251-2	Ball Bearing (N.D. #41309)	1
23	298-8516-34	Snap Ring 1.625 I.D. x 2" O.D. x .093" Thick (Reliance Divn. of Eaton Mfg. Co. #974)	1
24	102-3359-2	Spacer — U Joint	1
25	298-6076-91	Companion Flange (Dana Corp. #3-1-3341) — Circular Type, 1.500-10 Spline	1
26	102-7286-1	Nut — Main Shaft (Fuller No. 1846)	1
27	398-3000-18	Cotter Pin 1/8 x 2"	1
28	398-20001-20	Cut Washer 15/16" x 2" x 11/64"	1
29	X6752	Pipe Plug 3/4" (Magnetized)	2
30	298-8517-34	Snap Ring — External — 1.452 I.D. x 1.764 O.D. x .093 Thick (Reliance Divn. of Eaton Mfg. #916)	1
31	102-3361-1	Spacer	1
32	X203519	Bearing — Ball, Maximum Capacity Type, Medium Series 40 x 90 x 23 M.M. (Fafnir #308WD, MRC #308MF, N.D. #7608, SKF #308AZ)	2
33	102-30598-1	Low Countershaft Gear	1
34	102-3379-1	Shaft — (Countershaft)	1
35	102-3360-1	Spacer	1
36	102-30599-1	Gear — Countershaft Drive	1
37	102-7293-1	Nut — Countershaft Front Bearing (Fuller #8337)	1
38	298-3012-68	Oil Seal — Garter Spring Type 2 1/4" Shaft Dia. 3.355 O.D., 15/32" Wide (Sirvene — Type W4 — #22511)	1
39	402-1663-2	Cover	1
40	102-3371-1	Gasket	1
41	102-7284-1	Cover — Hand Hole	1
42	102-3372-1	Gasket — Hand Hole	1
43	398-10001-70	Round Head Mach. Screw 5/16 x 1/2"	4
44	398-20000-64	Lock Washer 5/16"	4
45	X6326	Bearing Ball 1/2"	1
46	102-7283-1	Spring	1
47	102-7290-1	Plug	1
48	102-3407-1	Bar — (Shift Rail)	1
49	402-647-2	Yoke — Shifter	1
50	102-7287-1	Lock Screw	2
51	398-99012-90	Lock Wire (.045 Dia. SAE 51430)	2
52	102-7299-1	Thimble — Oil Retaining	1
53	298-3520-68	"O" Ring 1/8 x 3/4 x 1" (National #622715)	1
54	402-649-2	Shifter Block	1
	*102-8506-1	Hydrostatic Motor — Sundstrand Model 22 — 3055 (See Separate Illustration)	1
55	*398-2005-88	Nylok HC-HT Cap Screw 1/2 x 1 3/4 (Motor to Case)	4
	*398-20001-13	Cut Washer 1/2"	4
56	*102-1781-1	Gasket	1

*Parts not included in 602-8409-1 two speed transmission assembly.

(C) FISCHE NO. 7 GRID D-17

Specify Quantity, Part Number and Description When Ordering — Rex



(C) FISCHE NO. 7 GRID D-18

DIFFERENTIAL ASSEMBLY
REX PART NUMBER WITH AXLES AND TUBES 502-6475-80
REX PART NUMBER WITHOUT AXLES AND TUBES 102-9795-1
DANA CORP. PART NUMBER WITHOUT AXLES AND TUBES 27943-28X
MODEL 848 SELF PROPELLED VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	102-9795-10	Drive Gear and Pinion Assembly Kit Consisting of Items 2 thru 13 (*706048-7X)	1
2	102-9795-11	Kit — Innner Pinion Bearing (*706060X)	1
3	.....	Shim — Drive Pinion Adjusting (Reference Only — Sold Only in 102-9795-10 Assembly	—
4	.....	Baffle — Pinion Bearing (Reference Only — Sold Only in Kit Form)	—
5	.....	Shim — Pinion Bearing Adjusting (Reference Only — Sold Only in Kit Form)	—
6	102-9795-12	Kit, Outer Pinion Bearing (*706045X)	1
7	.....	Slinger — Pinion Bearing Outer (Reference Only — Sold Only in Kit Form)	—
8	102-9795-13	Seal — Pinion (*35725)	1
9	102-9795-14	Washer — Pinion Nut (*30275)	1
10	102-9795-15	Nut — Pinion (*30271)	1
11	102-9795-17	Gasket — Carrier Cover (*34687)	1
12	.....	Shim — Differential Bearing (Reference Only — Sold Only in Kit Form)	—
13	102-9795-22	Bolt — Drive Gear (*30266)	12
14	102-9795-16	Companion Flange Assembly (*3-1-4031)	1
15	102-9795-23	Kit — Differential Case Assembly Consisting of Items 11 thru 13 and Items 16 thru 27 (*706050X)	1
16	102-9795-21	Kit — Differential Bearing (*706047X)	1
17	.....	Flange Half — Differential Case — Not Sold Separately	—
18	.....	Cap — Differential Case (Not Sold Separately)	—
19	.....	Shaft — Differential (Not Sold Separately)	1
20	.....	Pinion (Not Sold Separately)	4
21	.....	Gear — Differential (Not Sold Separately)	2
22	.....	Ring — (Not Sold Separately)	2
23	.....	Plate — (Not Sold Separately)	2
24	.....	Disc — (Not Sold Separately)	1
25	.....	Disc — Dished (Not Sold Separately)	1
26	.....	Plate — (Not Sold Separately)	1
27	102-9795-26	Bolt — Differential Case (*35104-2)	8
28	102-9795-24	Kit — Differential Parts — Consisting of Item 11 and 19 thru 26 (*706057X)	1
29	102-9795-25	Kit — Gear Carrier Cover — Consisting of Item 11 and Items 30 thru 32 (*706059X)	1
30	.....	Cover — Carrier (Not Sold Separately)	1
31	102-9795-18	Plug — Cover (*36472)	1
32	102-9795-19	Bolt — Carrier Cover (*34822)	10
33	.....	Differential Case (Sold Only as Complete Assembly Part No. 502-6475-80 — See Heading)	1
34	102-4803-1	Shaft — Pinion Gear	2
35	102-9795-20	Bolt — Bearing Cap (*500400-20)	4

*Spicer Axle Division, Dana Corporation Part Numbers

(C) FISCHE NO. 7 GRID D-19

Rexnord Inc
Milwaukee WI 53201

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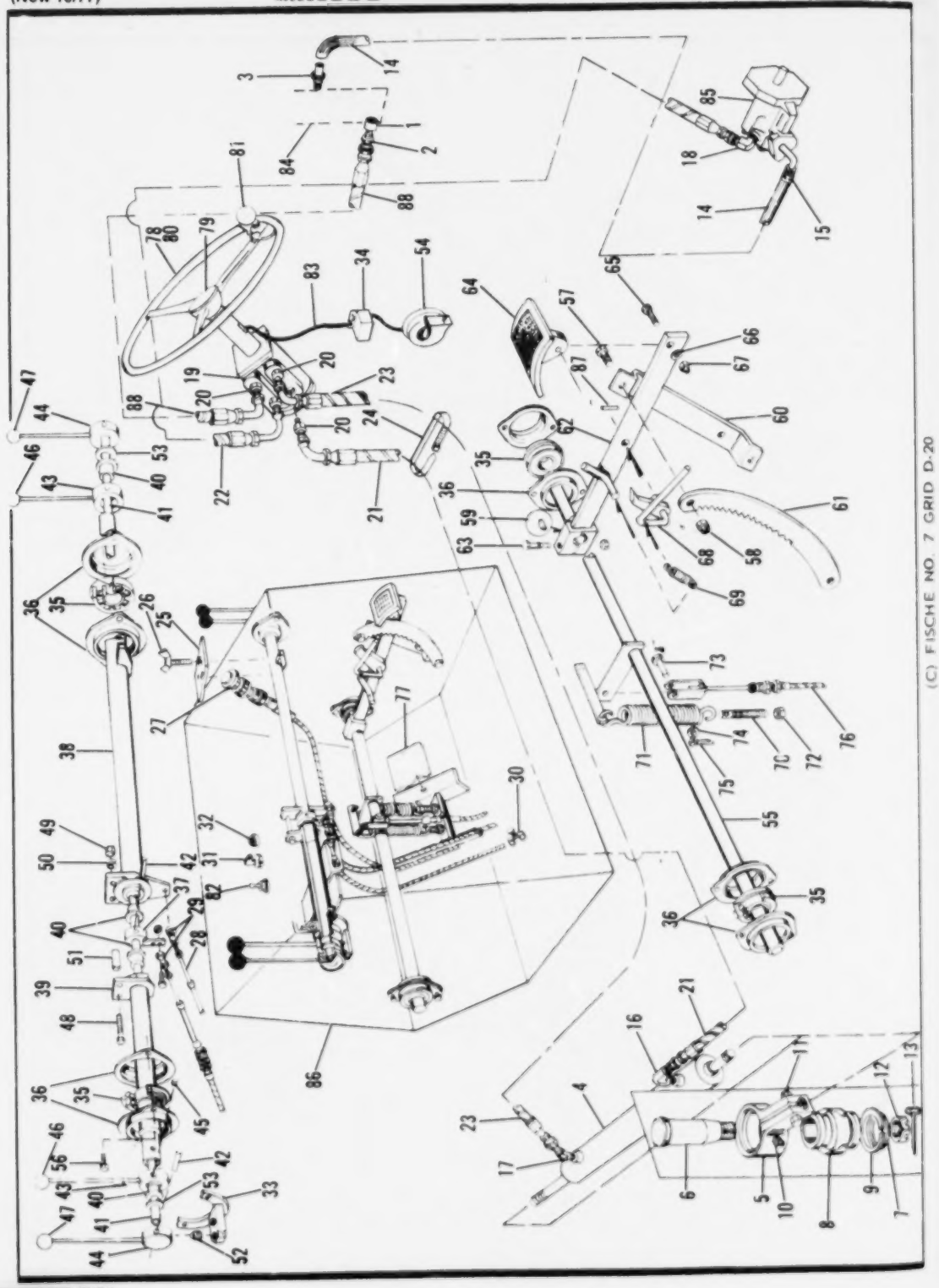

(C) FISCHE NO. 7 GRID D-20

Specify Quantity, Part Number and Description When Ordering

OPERATORS CONTROLS AT CONSOLE
STEERING, FORWARD REVERSE, THROTTLE, BRAKE
MODEL SP848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	398-14000-52	Coupling ½" N.P.T.	1
2	298-2172-62	Str. Adaptor ½" MNPT x ¾ - 16 Str. Thd.	1
3	298-8018-86	Hose Adaptor ½" MPT	1
4	102-30292-1	Hydraulic Cylinder — Steering (Green Mfg. Co. 73-386) See Separate Illustration	1
5	102-30437-1	Housing, Ball Stud	2
6	102-9767-1	Ball Stud	2
7	102-9768-1	Washer (3 Ply. Fabreeka x 1/16" thick) Impact	4
	59077	Special Washer	2
8	298-6806-8	Bushing — Radial	2
9	298-7527-34	Snap Ring — Internal (Truarc N5000-281)	2
10	398-8000-7	Lubrication Fitting #1610B	2
11	398-2002-30	Cap Screw ½ x 2¼" (Heat Treated)	2
	398-20000-39	Lock Washer ½"	2
	398-11000-22	Hex Nut ½"	2
12	398-11000-87	Castle Nut 1¼"	2
13	398-3000-68	Cotter Pin 5/16 x 2"	2
14	102-7033-3	Hose ⅝" x 33" long	1
15	298-9018-86	Hose Clamp	1
16	298-2171-62	Elbow — 90° ½" N.P.T.F. x ¾ - 16 J.I.C. (Anchor 8 Ma — 8 JMS)	1
17	298-8112-86	Elbow — 45° ½" NPTF x ¾ - 16 JIC	1
18	298-8111-86	Elbow — 90° ¾" "O" Ring x ¾ - 16 JIC	1
19	102-9236-1	Steering Control Valve — (Orbitrol-Char-Lynn No. YP12-SHF) See Separate Illustration	1
20	298-8110-86	Adapter — ¾ - 16 Male "O" Ring x ¾ - 16 Male JIC (Straight)	4
21	102-3701-2	Hose ½" I.D. x 88½" lg.	1
22	102-3701-5	Hose Assembly ½" I.D. x 136" lg.	1
23	102-3701-1	Hose Assembly ½" I.D. x 75" lg.	1
24	298-8516-68	Plastic Tie Clamp	15
25	102-9088-1	Plate — Stop Adjustment	1
26	502-241-80	Adjustment Screw	2
	298-32-71	Stainless Steel Nut 3/8" Wing	2
27	102-8642-4	Vernier Cable Control — Throttle 132" lg.	1
28	102-8672-6	Cable ¼ - 28 NF2 — Exciter Control — 3" Travel (Morse 43BC90)	1
29	298-276-2	Rod End — Female ¼" (Sealmaster FR-4)	2
30	102-7253-1	Cable Brake	2
31	298-6176-17	Ignition Lock Switch with Keys (Cole Hersee EX-17351)	1
	298-274-47	Key Only for Ignition Lock	—
32	298-6067-17	Push Button — StarterSwitch	1
33	502-8132-80	Bracket — Detent	1
34	298-15018-17	Relay — Horn — (DR 1116781)	1
35	298-314-2	Bearing — (Fafnir 1103KLLB3)	4
36	298-315-2	Flangette Bearing Mount (half) (Fafnir #62 MST)	8
37	502-8107-80	Lever — Direction Cable	1
38	502-8249-80	Tube — R.H. Control — Vibratory	1
39	502-8102-80	Tube — L.H. Control — Vibratory	1
40	298-5019-8	Bushing (Nylined)	4
41	102-30130-1	Shaft — Dual Control — (Direction)	1
42	298-6004-34	Roll Pin ¼ x 1⅞"	3
43	502-8106-80	Control Lever — Vibration	2
44	502-8199-80	Control Lever — Direction	2
45	398-17002-15	Nylok Socket Hd. Set Screw ⅜ x ⅜"	4
46	102-7190-1	Red Knob — Exciter Control	2
47	X204135	Black Knob — Direction	2
48	398-2001-92	Cap Screw ⅜ x 3"	2
49	298-2012-71	Lock Nut ⅜" N.C.	5
50	398-20000-23	Cut Washer ⅜"	2
51	102-9089-1	Spacer Tube	2
52	298-300-47	Ball Plunger ⅜" Dia. — ⅝-11 thd.	2
53	298-32-97	Thrust Washer	6

OPERATORS CONTROLS AT CONSOLE — (Continued)
MODEL SP848 VIBRATORY ROLLER

Item No.	Part Number	Description	No. Req'd.
54	102-9149-2	Horn (DR. 9000130)	1
	102-9149-3	Nut (Horn to Bracket) (DR. 1965698)	1
	102-9149-4	Bracket — 90° (DR. 1958667)	1
55	502-8325-80	Cross Shaft — Brake	1
56	398-95001-95	Carriage Bolt ⅜ x 1"	8
	398-20000-37	Lock Washer ⅜"	8
	398-11000-19	Nut ⅜"	8
57	398-2002-16	Cap Screw ½ x 1"	4
58	298-2010-71	Lock Nut ½"	4
59	398-6000-96	Woodruff Key — ¼ x 1"	1
60	102-9736-1	Bracket — Brake	1
61	298-322-47	Ratchet	1
62	502-8336-81	Brake Lever	1
63	398-20000-37	Lock Washer ⅜"	1
	398-11000-19	Nut ⅜"	1
	398-2001-89	Cap Screw ⅜ x 2½"	1
64	402-1596-2	Foot Pedal	1
65	398-95000-99	Cap Screw ⅜ x 1¾"	1
66	398-20000-23	Cut Washer ⅜"	2
67	398-11000-19	Hex Nut ⅜"	1
68	502-8337-80	Brake Release	1
69	202338	Spring	1
70	102-9739-1	Holder — Spring	2
71	102-699-1	Spring	2

No. Item	Part Number	Description	No. Req'd.
72	398-11000-19	Hex Nut ⅜"	2
73	298-129-47	Pin Clevis (One Each End)	2
74	398-20001-2	Cut Washer ⅜" SAE	2
75	398-3000-6	Cotter Pin 1/16 x ¾"	2
76	102-30477-1	Emergency & Parking Brake Push Pull Cable	1
77	102-9737-1	Brake Cover (plate 12 Ga. x 7¼ x 1 ft. 2 lg. cover cables & wiring)	1
78	298-68-47	Steering Wheel	1
79	102-9148-1	Horn Button Kit	1
80	298-9-71	Nut — Steering Wheel	1
81	298-278-47	Knob — Steering Wheel	1
82	298-6123-17	Switch — Toggle — Lights	1
	298-52-17	Seal — Toggle Switch	1
83	102-30524-1	Wire Set — Horn (84" long)	1
	102-30524-2	Wire Set — Horn (40" long)	1
84	502-6230-80	Hydraulic Tank — Reference Only	1
85	102-7949-1	Pump — Steering — (Vickers VTM-42-60-75-15-MD-R1-14) See Separate Illustration	1
86	502-6452-80	Operators Console (Reference Only)	1
87	298-6021-34	Roll Pin ⅛ x ¾"	1
88	102-3701-4	Hose Assembly ½" I.D. x 102" long	1

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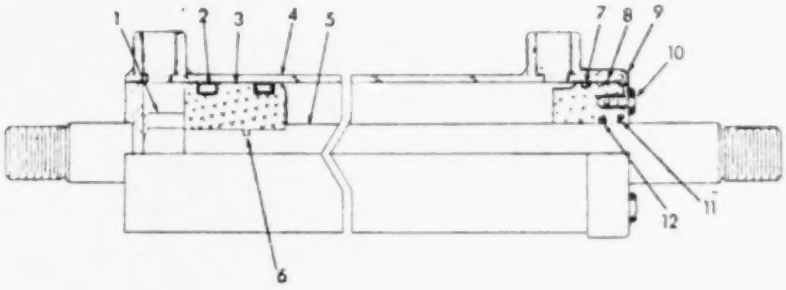
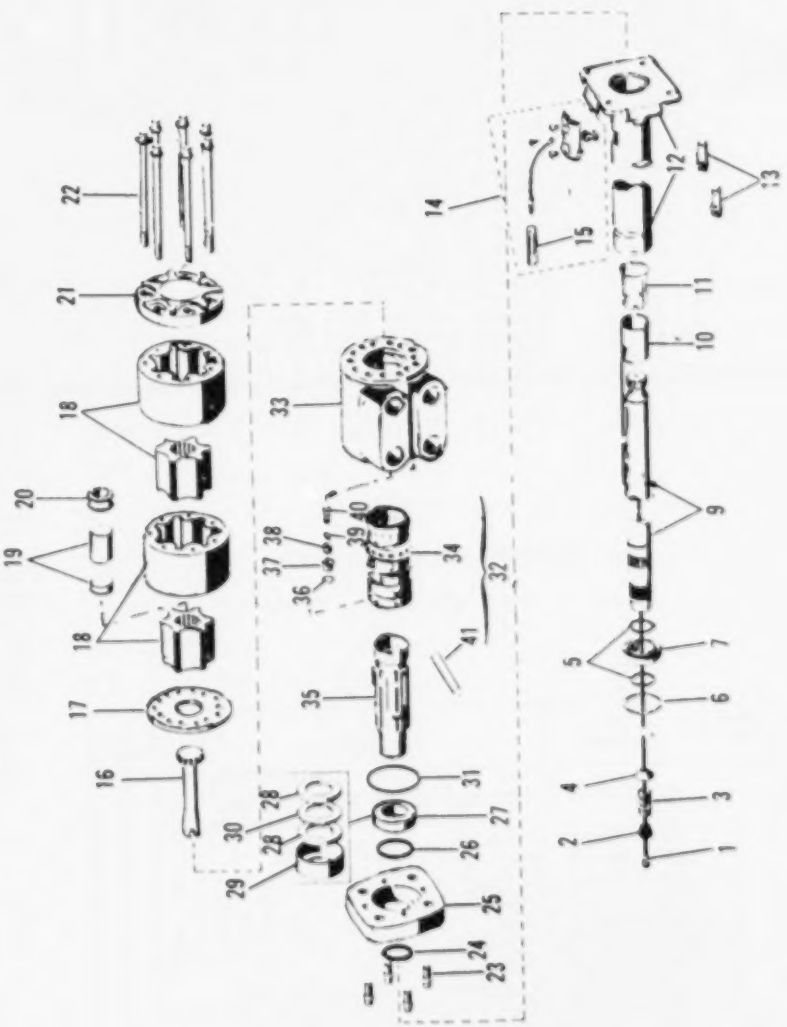


STEERING CYLINDER (GREEN)

Item No.	Part Number	Description	No. Req'd.
	102-30292-01	Steering Cylinder (Green #73-386) Incls. the following Service Parts	1
1	102-30292-11	Lock Nut	1
2	*102-30292-12	Poly-Pac	2
3	102-30292-13	Piston	1
4	102-30292-14	Barrel Assy.	1
5	102-30292-15	Rod	1
6	*102-30292-16	"O" Ring	1
7	*102-30292-17	"O" Ring	1
8	102-30292-18	Lock Wire	1
9	102-30292-19	Cap	2
10	102-30292-20	Cap Screw	2
11	*102-30292-21	Dust Seal	1
12	*102-04714-19	"O" Ring	1
—	102-30292-22	Seal Service Kit Incls. *Items 2, 6, 7, 11 & 12	1

(C) FISCHE NO. 7 GRID D-23



(C) FISCHE NO. 7 GRID D-24

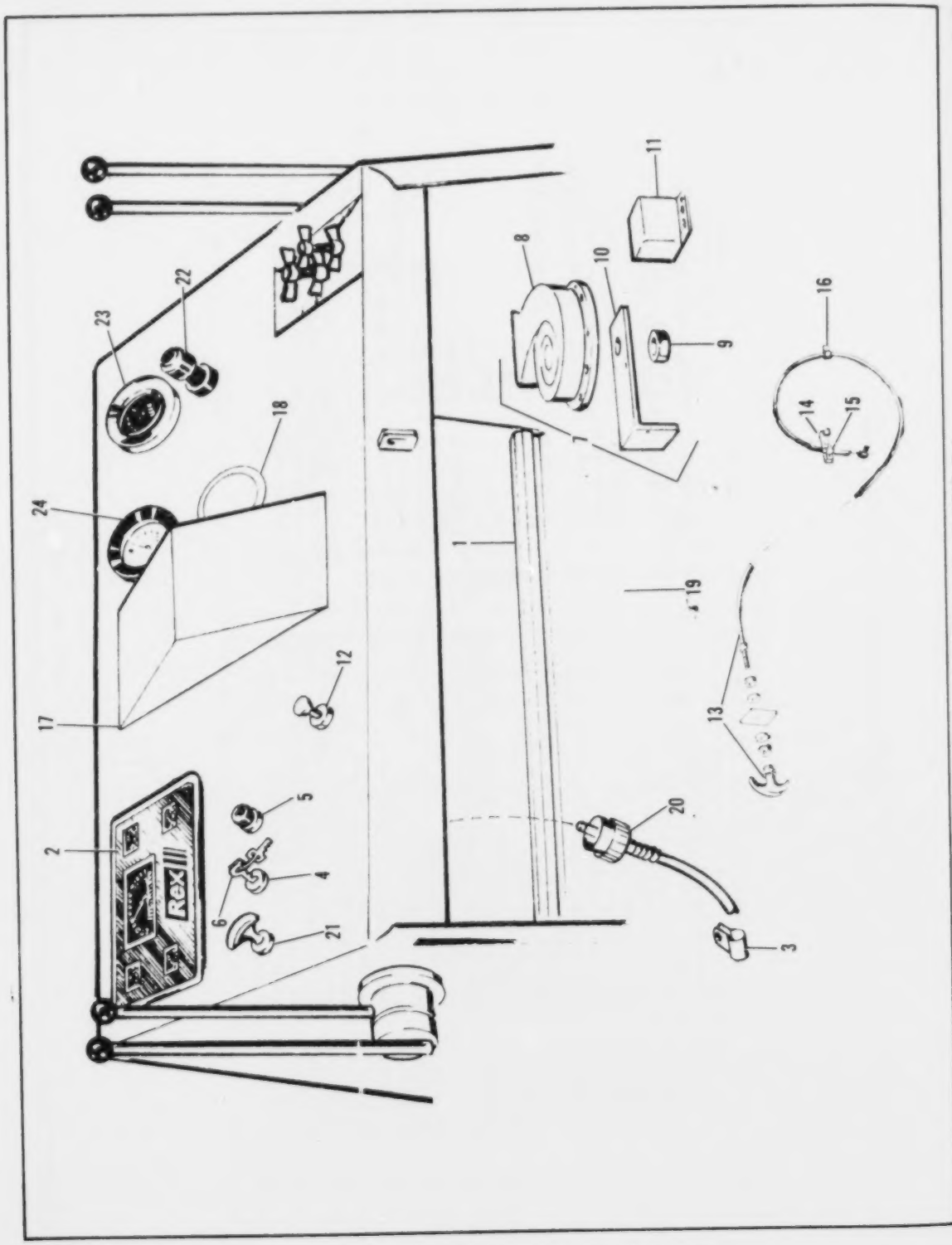
Always Give Serial Number of Machine

ORBITROL STEERING VALVE — CHAR-LYNN

Item No.	Part Number	Description	No. Req'd.
—	102-09236-01	Steering Valve (Char-Lynn *YP12-SHF)	1
1	102-09106-10	Terminal & Wire (21142-1)	1
2	102-09106-11	Insulator Contact (*21138)	1
3	102-09106-12	Spring Contact (*5029)	1
4	102-09106-13	Washer Contact (*5028)	1
5	102-08077-21	Ring, Snap (*14092)	2
6	102-08077-22	Ring, Retainer (*5245)	1
7	102-08077-23	Bearing Assy. (*21146)	1
8	.....	Not Used	.
9	102-09106-14	Shaft Assy. (*6783)	1
10	102-09106-15	Ring, Contact (*21149)	1
11	102-09106-16	Insulator (*21151)	1
12	102-09106-17	Tube & Flange (*6785)	1
13	.....	Cap Screw ⅜ - 16 x ⅞"	2
14	102-09106-18	Horn Brush Kit (*6414)	1
15	102-09106-19	Connector (*21173)	1
16	102-09106-20	Drive (*5126)	1
17	102-09106-21	Plate (*5414)	1
18	102-09236-10	Gear Set (*5664-8)	2
19	102-09236-11	Spacer (*5178)	1
20	102-09106-24	Spline (*5213)	1
21	102-09106-25	Cap, End (*6481)	1
22	102-09236-12	Cap Screw 12 pt. x 3" (*5389-14)	7
23	102-09236-13	Cap Screw ⅜"-18x⅝"(*21046-1)	4
24	**	Oil, Seal	1
25	102-09106-26	Plate, Valve Housing (*843)	1
26	**	Seal	1
27	102-09106-27	Bearing Kit (*64006) (Incls. 28, 29, 30)	1
28	102-09106-28	Race, Bearing (*5542)	2
29	102-09106-29	Locator, Bearing (*5543)	1
30	102-09106-30	Bearing, Thrust Needle (*5544)	1
31	**	"O" Ring	1
32	102-09106-31	Control Kit (*6419) (Incls. 33-41)	1
33	***	Housing	1
34	***	Sleeve	1
35	***	Spool	1
36	**	"O" Ring	1
37	102-09106-32	Plug Seal (*21124)	1
38	102-09106-33	Seat, Check (*859)	1
39	102-09106-34	Ball, Steel (*18026)	1
40	102-09106-35	Spring, Compression (*857)	1
41	102-09106-36	Pin, Centering (*15)	1
42	102-08077-16	Seal Kit (*5140) (Incls. 24, 26, 31, 36)	1

*Char-Lynn Co. part numbers
**Parts Included in Seal Kit, item 42.
***Parts Included in Control Kit, item 32 — Not Sold Separately.

(C) FISCHE NO. 7 GRID D-25

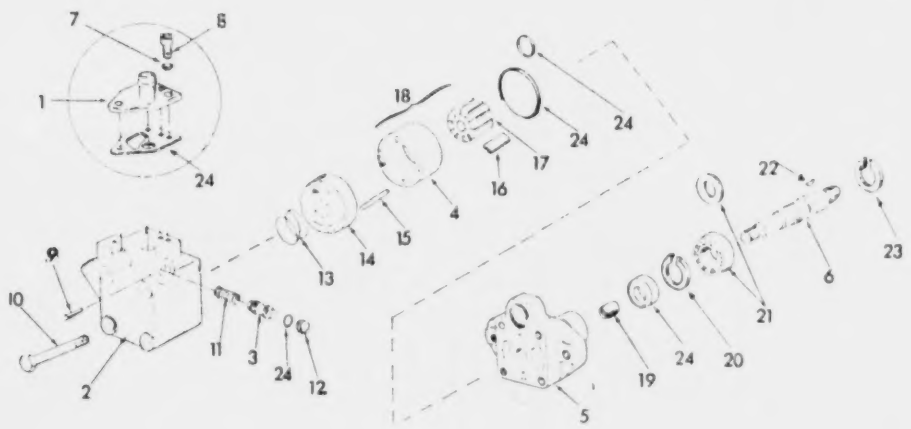


(C) FISCHE NO. 7 GRID E-1

OPERATORS CONSOLE & INSTRUMENTS — PANEL SWITCHES
EMERGENCY STOP — MODEL 848 VIB. ROLL

Item No.	Part Number	Description	No. Req'd.
1	X203699	Channel, Rubber	2
2	102-4375-1	Instrument Cluster Assembly Consisting of:	1
	102-4375-11	Ammeter — (Stewart Warner #440436)	1
	102-4375-12	Water Temperature Gauge (Stewart Warner #442784)	1
	102-4375-13	Oil Pressure Gauge (Stewart Warner #444642)	1
	102-4375-14	Fuel Gauge (Stewart Warner #441343)	1
	102-4375-15	Tachrometer (Stewart Warner #551-LR)	1
	102-4375-16	Glass (Stewart Warner #411329)	1
	102-4375-17	Bezel (Stewart Warner #41322)	1
3	298-9032-86	Cable Clamp	2
4	298-6176-17	Switch — Lock (Cole Hersee #EX17351)	1
5	298-6067-17	Switch, Start, Push Button (Cole Hersee #9216)	1
6	298-274-47	Key (Cole Hersee #83357)	1
7	102-9149-1	Horn Package Kit (Includes Item 8 thru 10 Inclusive)	1
8	102-9149-2	Horn (Delco #9000513)	1
9	102-9149-3	Nut	1
10	102-9149-4	Bracket	1
	102-9149-5	Bracket	1
11	298-15018-17	Relay — Horn	1
12	298-6123-17	Switch — Lights	1
13	102-7957-2	Cable — Emergency Stop 48" lg. (Morse #B48701) (on Hydraulic Tank)	1
14	102-8022-1	Mounting Bracket (on Hyd. Tank Shell)	1
15	298-145-47	Cable Clamp (Morse #A31804)	1
16	298-30-47	Cable Clamp	1
17	502-6433-80	Instrument Panel	1
18	298-121-17	Plug Button 3"	1
19	502-6265-80	Floorboard, Console	1
20	102-30188-2	Flexible Shaft — Tachrometer	1
21	102-7957-1	Cable — Pull to Stop — 144" lg.	1
22	102-8642-4	Cable — Throttle 132" lg.	1
23	102-8743-1	Frequency Meter	1
	602-34-1	Fuse and Holder	1
	298-12022-17	Fuse 1 Amp.	1
24	102-9892-1	Vibration Meter (Amplitude)	1

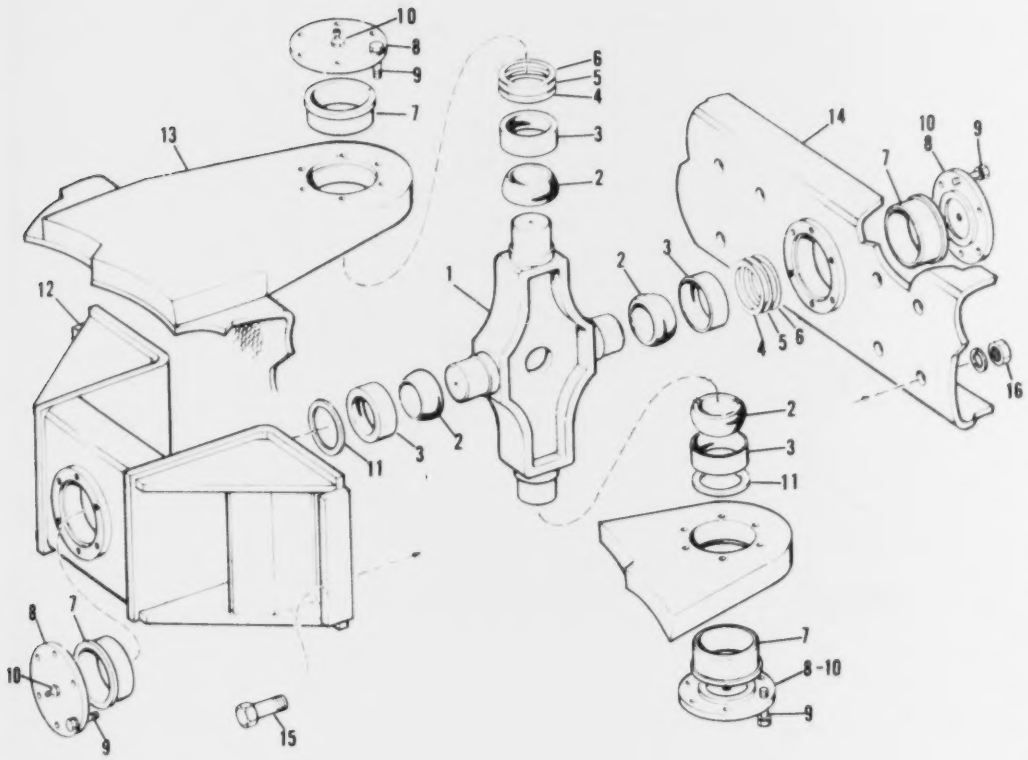
(C) FISCHE NO. 7 GRID E-2



HYDRAULIC PUMP – STEERING
VICKERS PART NUMBER VTM42-60-75-15-MD-R1-12
REX PART NUMBER 102-7949-1

Item No	Part Number	Description	No Req'd
1	102-7949-10	Manifold Sub-Assembly (*281409)	1
2	102-7949-11	Cover Sub-Assembly (*286613)	1
3	102-7949-12	Control Valve Sub-Assembly (*232797)	1
4	102-7949-13	Ring (*296599)	1
5	102-7949-14	Body Sub-Assembly (*296601)	1
6	102-7949-15	Shaft (*250455)	1
7	102-7949-16	Washer (*28931)	1
8	102-7949-17	Screw (*199144)	3
9	102-7949-18	Pin (*32559)	1
10	102-7949-19	Screw (*171523)	4
11	102-7949-20	Spring (*170072)	1
12	102-7949-21	Plug (*175049)	1
13	102-7949-22	Spring (*245507)	1
14	102-7949-23	Pressure Plate (*276396)	1
15	102-7949-24	Pin (*154364)	2
16	102-7949-25	Vane Kit (*922594) (10 pcs.)	1
17	102-7949-26	Rotor (*213859)	1
18	102-7949-27	Cartridge Kit (*923092)	1
19	102-7949-28	Bearing (*222440)	1
20	102-7949-29	Snap Ring (*106641)	1
21	102-7949-30	Bearing (*148423)	1
22	102-7949-31	Key (*1606)	1
23	102-7949-32	Snap Ring (*172376)	1
24	102-7949-33	Seal Kit (*922904)	1

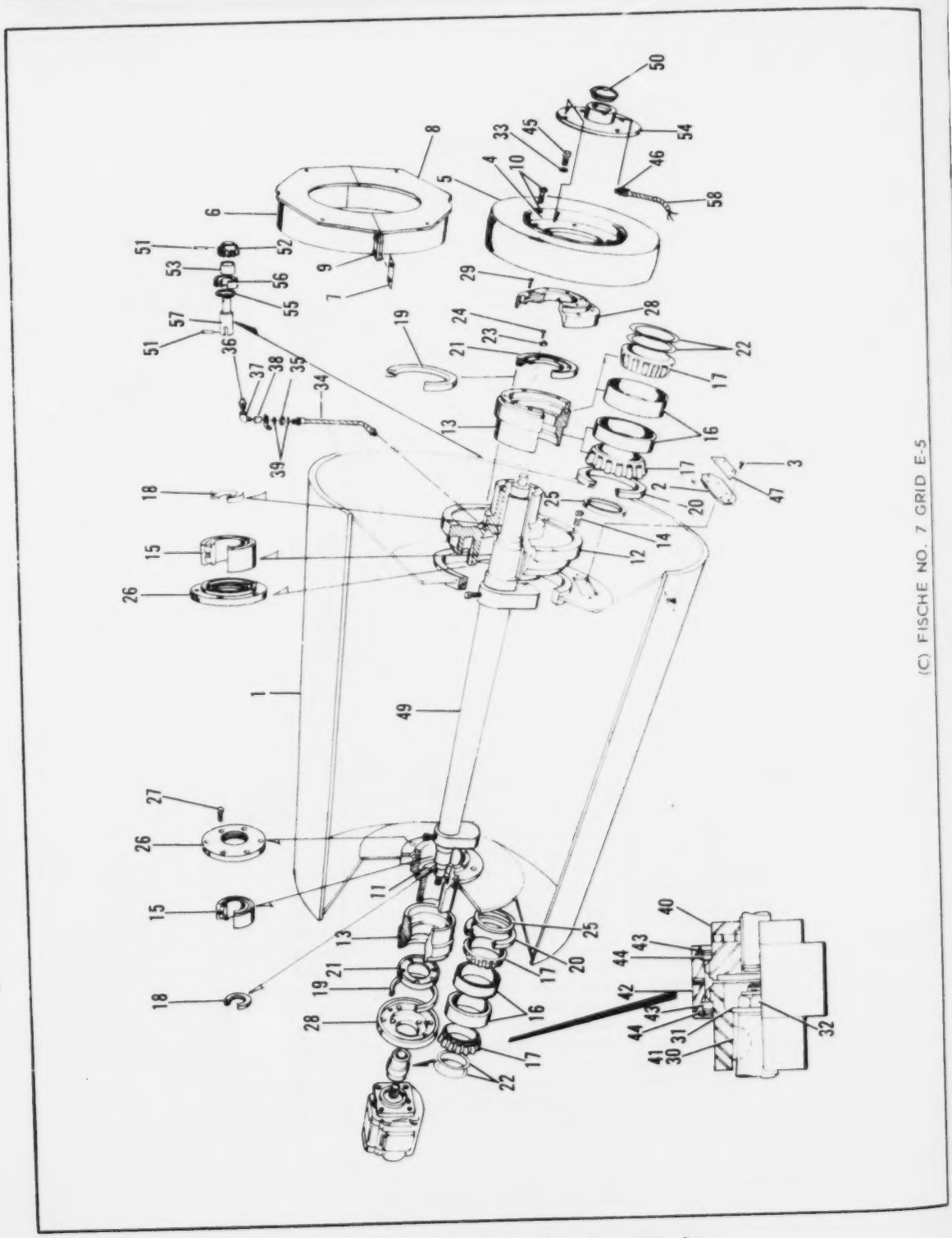
*Vickers Incorporated – P.O. Box 302 – Troy, Michigan 48084 part numbers.



Item No.	Part Number	Description	No. Req'd.
1	402-02616-04	Articulating Cross	1
2	298-10027-02	Inner Bearing Ring	4
3	298-10028-02	Outer Bearing Ring	4
4	102-08757-03	Shim (.050")	4
5	102-08757-02	Shim (.010")	8
6	102-08757-01	Shim (.005")	12
7	102-03977-01	Sleeve - Bearing	4
8	102-03978-01	Bearing Retainer	4
9	398-02002-28	Cap Screw ½ - 13 x 2" H.C.-H.T.	24
10	398-08000-07	Lube Fitting, ⅛" NPT #1610	4
11	102-08757-04	Shim (.125")	2
12	502-04676-80	Bracket - Bearing Housing	1
13	502-07107-80	Roll Frame	1
14	502-7124-80	Main Frame	1
15	398-02004-80	Cap Screw ¾ x 5 H.C.-H.T.	8
16	298-02035-71	Stop Nut ¾"	8

Mar. '73

(C) FISCHE NO. 7 GRID E-4



Always Give Serial Number of Machine

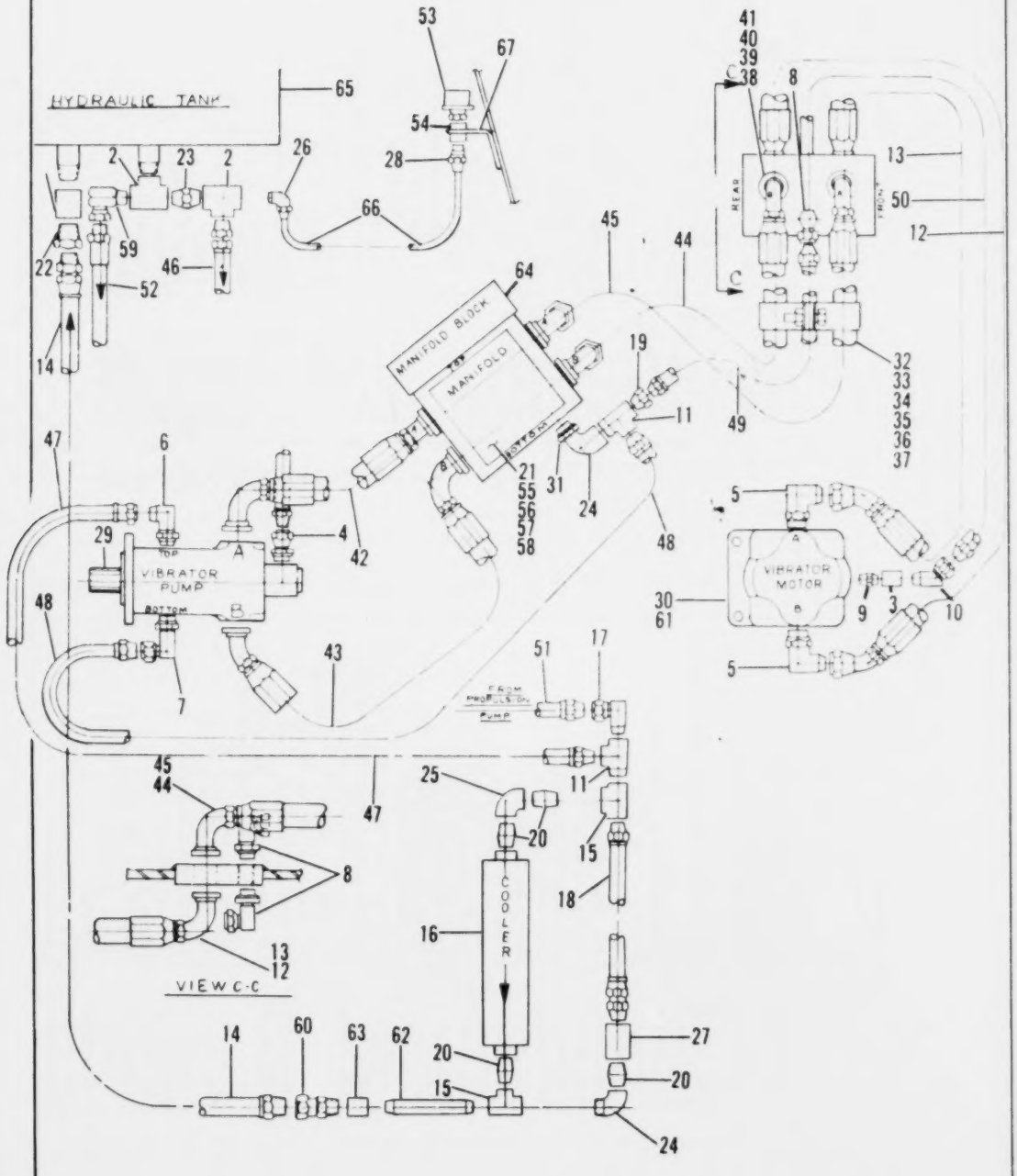
VIBRATORY ROLL ASSEMBLY
MODEL 848 VIBRATORY ROLLER ONLY

Item No.	Part Number	Description	No. Req'd.
1	502-5979-80	Vibratory Roll (Shell only)	1
2	102-3647-1	Inspection Cover	2
3	298-28-93	Nylok Cap screw 3/8 x 1"	4
4	502-4936-80	Wheel	2
5	298-6035-68	tire — Radial 165-SR15 (Goodyear)	2
	298-6036-68	tube	2
6	502-4814-80	Isolator housing — top half	2
7	102-9801-1	Shim	4
8	502-4383-80	tire housing — lower half	2
9	398-2003-5	Hex head cap screw 3/4 x 2-3/4"	8
	298-2035-71	Locknut 3/4"	8
10	298-46-93	Self locking cap screw 5/8 x 2-1/4"	12
	398-20000-41	Lock Washer	12
11	402-2606-2	Roll hub (drive side)	1
12	402-2607-2	Hub (Driven Side)	1
13	402-2605-2	Wheel hub	2
14	298-88-93	Self locking cap screw 3/4 x 3-1/4"	16
	298-36-97	Hardned washer 3/4"	16
15	298-312-2	Spherical Bearing (SKF No. EPVB-452320-M2/W22)	2
16	298-274-2	Bearing Cup (Timken No. L435010)	4
17	298-275-2	Bearing Cone (Timken No. L435049)	4
18	298-3089-68	Oil Seal 3-3/4" I.D. (National No. 415379, Federal — Mogal — Bower or C.R. No. 37390)	2
19	298-3093-68	Oil-Seal (National, No. 455595)	2
20	298-3094-68	Oil Seal (National No. 415489, or Johns — Manville No. 15382 LDS)	2
21	102-4516-1	Bearing Carrier Ring	2
22	102-7897-1	Shim (as required .005")	2
	102-7897-2	Shim (as required .0075")	2
	102-7897-3	Shim (as required .020")	1
23	102-7900-1	tab-Lock, Bolt	12
24	398-2001-77	Heat treated cap screw 3/8 x 1"	12
25	102-3646-1	Bearing spacer	2
26	402-1693-2	Retainer	2
27	298-12-93	Self locking cap screw 1/2 x 1-1/2"	12
	398-20000-39	Lock Washer 1/2"	12

Item No.	Part Number	Description	No. Req'd.
28	402-2604-2	Flange	2
29	298-19-93	flat head self locking machine screw 3/8 x 1"	8
30	398-6001-15	Woodruff key #1210	1
31	398-20000-81	Cut Washer 7/8"	1
32	298-2045-71	Lock nut 7/8-14 U.N.F.	1
33	398-2000-39	Lock Washer 1/2"	4
34	X7846	Grease Hose	2
35	X7328	Rubber Grommet	2
36	398-95004-31	Alemite fitting A1184	2
37	298-315-47	90°Angle Body (Lincoln 20029) 1/8" P.T. female x 1/8" male	2
38	398-14000-44	Steel Coupling 1/8"	2
39	398-20000-23	Cut Washer 3/8"	4
40	102-7974-1	Coupling half — Drive — Exciter (Motor End) — Splined	1
41	102-7975-1	Coupling half — Driven — (Roll End) tapered with key way	1
42	102-7976-1	Coupling Sleeve	1
43	298-3095-68	Seal — Coupling	2
44	298-7020-34	Snap ring	2
45	298-62-93	Self locking Cap Screw 1/2 x 1-1/4"	4
46	298-103-17	Magnetic pick up	1
47	102-30782-1	Lubrication plate	2
			8
49	502-2998-80	Roll shaft with weights	1
50	298-4006-47	Hub Cap	1
51	298-6004-34	Roll Pin	2
52	102-8649-1	Gear	1
53	102-8651-1	Spacer	1
54	502-4648-80	Bearing Flange	1
55	298-7517-34	Snap ring	1
56	298-289-2	Ball Bearing	1
57	102-3932-1	Shaft	1
58	502-205-80	Cord	1

(C) FISCHE NO. 7 GRID E-6

Always Give Serial Number of Machine


HYDRAULIC TANK
MANIFOLD BLOCK
TOP MANIFOLD
BOTTOM
VIBRATOR PUMP
TOP
BOTTOM
VIBRATOR MOTOR
COOLER
FROM PROPEL CIR. PUMP
REAR
FRONT
VIEW C-C
(C) FISCHE NO. 7 GRID E-7

VIBRATOR HYDRAULIC SYSTEM
MODEL SP848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	298-2078-62	Coupling 1" N.P.T.	1
2	298-17002-86	Tee — Pipe ¾" N.P.T.	2
3	298-14503-86	Reducer Bushing ¾ x ¼" N.P.T.	1
4	298-8080-86	Adapter — Straight ⅞" O Ring x ¾" N.P.T.	1
5	298-8148-86	Elbow	2
6	298-8030-86	Elbow — 90°, ⅜" O Ring x J.I.C.	1
7	298-2093-62	Elbow 90°, ⅜" O Ring x ½" N.P.T.	1
8	298-2245-62	Elbow 90°, 7/16" O Ring x ¼" N.P.T.	2
9	298-12003-86	Nipple ¼ N.P.T.	1
10	298-2081-62	Street Elbow ¼ NPTF x 45°	1
11	298-2246-62	Service Tee ½" NPTF	2
12	102-3695-1	Hose Assy. 54½" lg.	1
13	102-3702-1	Hose Assy. 53¼" lg.	1
14	502-1350-94	Hose Assy. 72" lg.	1
15	298-17010-86	Tee ½" NPTF	2
16	298-5054-92	Oil Cooler (Reference Only)	1
17	298-2075-62	Elbow 90° x ½" NPT	1
18	502-1347-85	Hose Assembly — 36" long	1
19	X7484	Reducer Bushing ½" x ⅜" N.P.T.	1
20	298-12001-86	Close Nipple ½" N.P.T.	4
21	102-4365-79	Manifold Relief Valve (2000 P.S.I.) (SP848 only)	1
			1
22	298-14500-86	Reducer Bushing 1" x ¾" N.P.T.	1
23	298-12002-86	Close Nipple ¾" N.P.T.	1
24	X7487	Street Elbow ½" N.P.T. x 90°	2
25	298-2247-62	Elbow ½" N.P.T. x 90°	1
26	298-19-1	Elbow — 90°, ¼" Tube x ¼" N.P.T.	1
27	298-2170-62	Check Valve	1
28	298-15-1	Connector — ¼" Tube x ¼" N.P.T.	1
29	102-8704-1	Hydraulic Pump (See Separate Illustration)	1
30			1
	*102-9742-1	Hydraulic Motor, Vibrator (Commercial Shearing & Stamping 51 Series Part No. D231-20) — See Separate Illustration.	1
31	298-2248-62	Adapter — ⅞" O Ring, x ½" N.P.T	1
32	X7604	Cold Shut 3/16"	3
33	102-8094-1	Bar, Connecting	1
34	298-9035-86	Hose Clamp	4
35	398-02002-16	Cap Screw ½ x 1"	1
36	398-20000-39	Lock Washer ½"	1
37	398-11000-22	Hex Nut ½"	1
38	102-1594-4	"O" Ring (SAE 1")	10
39	298-8033-86	Split Flange Clamp 1"	20
40	398-02005-56	H.C. — H.T. Cap Screw ⅜ x 1¼"	40
41	398-20000-37	Lock Washer ⅜"	40
42	102-3998-1	Hose Assembly — 33" long	1
43	102-30467-1	Hose Assembly — 21¾" long	1
44	102-3946-1	Hose Assembly — 56" long	1
45	102-3946-2	Hose Assembly — 62" long	1
46	102-3849-3	Hose Assembly — 30" long	1
47	502-2785-80	Hose Assembly — 88" lg.	1
48	502-1347-84	Hose Assembly — 33" lg.	1
49	502-8004-80	Hose Assembly — 62" lg.	1
50	502-8367-83	Hose Assembly — 6 ft. long	1
51	502-8005-80	Hose Assembly — 20" lg.	1
52	102-3688-2	Hose Assembly — 76" lg.	1
53	298-2086-56	Vacuum Gauge	1
54	398-99000-17	Coupling — ¼" N.P.T. Galvanized	1
55	102-4365-33	"O" Ring	1
56	102-4365-40	"O" Ring	2
57	102-4365-41	Back-Up Ring	2

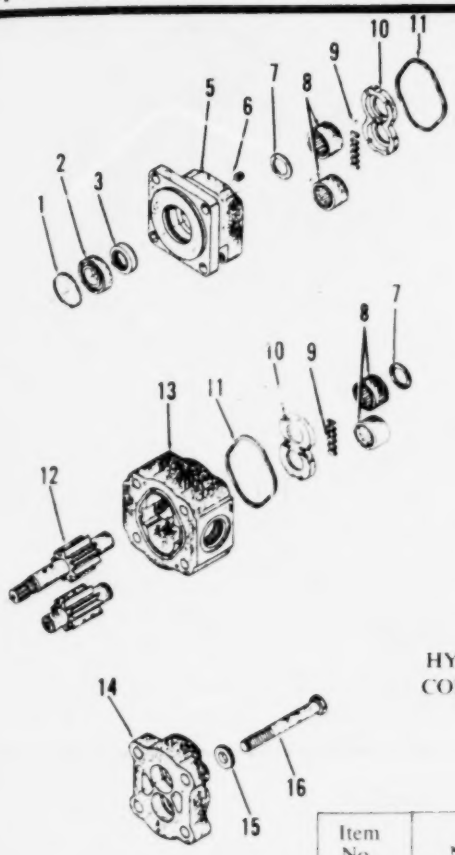
(C) FISCHE NO. 7 GRID E-8

VIBRATOR HYDRAULIC SYSTEM — (Continued)
MODEL SP848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd
58	398-2006-79	H.C.-H.T. Cap Screw 5/16 x 3¾"	6
59	298-2068-62	Swivel Adapter 90° x ¾" N.P.T.	1
60	298-2244-62	Adapter ¾" Female x ½" Male NPTF.	1
61	.....	Not Used	—
62	398-14007-56	Nipple ½ x 4" Galvanized — TBE.	1
63	398-14000-53	Coupling — ½" Galvanized	1
64	102-5254-1	Manifold Block	1
65	502-6230-80	Hydraulic Tank (Reference Only)	1
66	398-99004-35	Copper Tube ¼" O.D. x .032" wall x 4 ft. long	1
67	398-99004-35	Bracket, Vacuum Gauge	1

*Vendor, Commercial Shearing & Stamping Co. has instituted a design change —
— to replace entire motor on model SP848 furnish 102-9833-1 rebuilt, fully warranted motor or 102-8580-1 motor.

Rex
Specify Quantity, Part Number and Description When Ordering
Rexnord
Always Give Serial Number of Machine

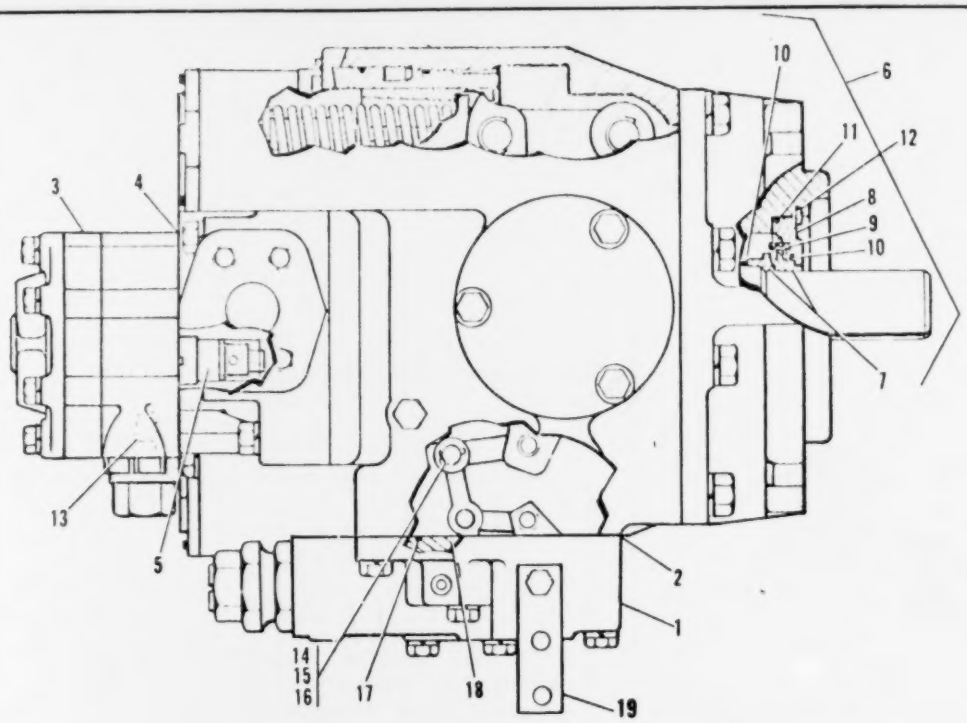


HYDRAULIC MOTOR — VIBRATION DRIVE
COMMERCIAL SHEARING INC. NO. D231-20
REX PART NUMBER 102-9742-1

Item No.	Part Number	Description	No. Req'd.
1	102-9517-10	Snap Ring (*X134-283)	1
2	102-9517-11	Ball Bearing (*X69-58)	1
3	102-9742-10 102-9742-11	Lip Seal (*X73-50-8) Retainer for Lip Seal (*AC1669)	1
4	.....	Not Used	—
5	102-9742-12	Shaft End Cover (*Computer No. 313-5037-402)	1
6	102-7884-10	Check Assembly (*M1391K)	2
7	102-9517-14	Ring Seal (*NB1669-1)	2
8	102-7883-11	Roller Bearing (*S1032)	4
9	102-9517-15	Pocket Seal (*BA3026-1)	12
10	102-9742-13	Thrust Plate (*Y1058-1)	2
11	102-7883-17	Gasket Seal (*UB3006-244)	2
12	102-9742-14	Integral Shaft and Gear Set (*PD1135M-1-15)	1
13	102-9742-15	Gear Housing (*Computer No. 313-8215-901)	1
14	102-9517-19	Part End Cover (*Computer No. 313-3120-100)	1
15	102-7463-22	Washer (*144-3)	4
16	102-7463-23	Cap Screw (*X2-27)	4
17	102-9832-20	Dowel Pin (Not Illustrated) (*Computer No. 391-2082-032)	4
18	102-9742-16	Pipe Plug (Not Illustrated) (*X1-11) — ¼" NPT Drain	1

*Commercial Shearing Co., Youngstown Ohio part numbers

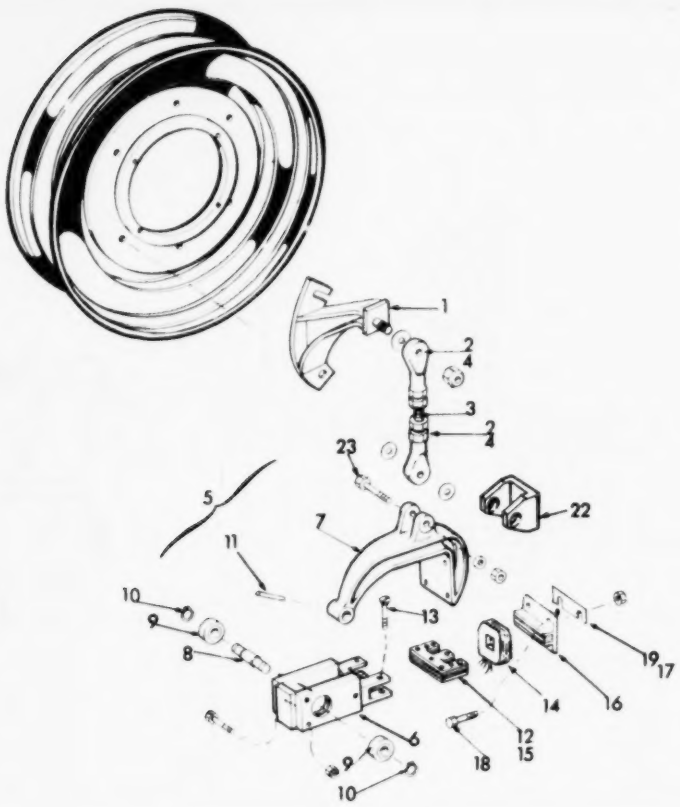
(C) FISCHE NO. 7 GRID E-10



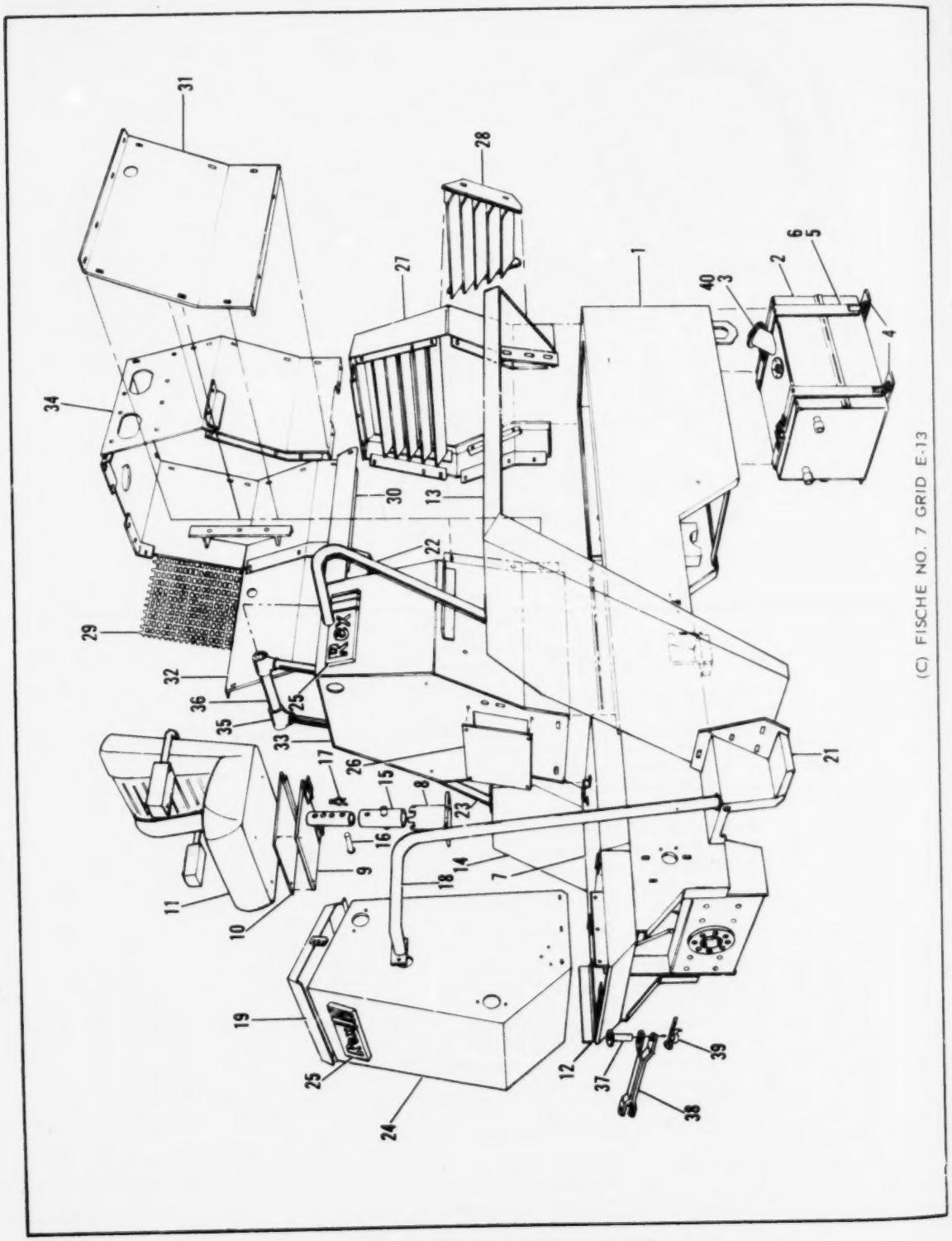
HYDRAULIC PUMP — VIBRATOR
SUNDSTRAND MODEL NO. HT22-2080
REX PART NO. 102-8704-1
USED ON MODEL 848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	102-4365-80	Control Valve (*9800893)	1
2	102-4365-6	Control Valve Gasket (*9800138)	1
3	102-4365-8	Charge Pump	1
4	102-4365-11	Charge Pump Gasket (*9220327)	1
5	102-4365-12	Check Valve (*9800648)	1
6	102-4365-1	Seal Kit – Consists of Items 7 thru 11	1
7		Shaft Seal	1
8		Housing Seal Retainer	1
9		Seal Spring	6
10		"O" Ring	2
11		"O" Ring	1
12	102-4365-47	Retaining Ring (*9006320-0025)	2
13	102-4365-52	Charge Pump Rel. Valve Poppet (*9800597)	1
14	102-4365-48	Cotter Pin (*90046-0607)	1
15	102-4365-49	Pin (*9220441)	1
16	102-4365-50	Washer (*9009610-2850)	1
17	102-4365-51	"O" Ring (*9004101-0140)	3
18	- - - - -	Special Control Valve (*980-1303-1)	1
19	102-4365-46	Control Shaft Handle	1

* Sundstrand Part Numbers — Rebuilt Pumps Available at Spec. Price.



Item No.	Part Number	Description	No. Req'd.
1	502-04747-80	Bracket, Link	1
2	298-00218-02	Rod End ⅝"	2
3	102-08522-01	Threaded Rod ⅝"	1
4	398-11000-72	Jam Nut ⅝"	2
5	602-03145-01	Transducer Assy., incls. 6 thru 19	1
6	102-04748-1	Mounting Frame	1
7	402-01728-02	Oscillating Frame	1
8	102-08520-01	Shaft	1
9	298-00286-02	Ball Bearing, Sealed	2
10	298-08521-34	Retaining Ring	2
11	298-06018-34	Roll Pin 3/16" x 1½"	1
12	502-02931-80	Core Stack, Stationary	1
13	398-02001-52	Cap Screw ¼" x 2"	3
14	102-08728-01	Transformer, Coil	1
15	398-03000-63	Cotter Pin ⅛" x 1½"	1
16	502-02930-80	Core Stack, Oscillating	1
17	102-08521-01	Shim .005"	8
18	398-02001-46	Cap Screw ¼" x 1"	4
19	102-08521-02	Shim .050"	2
21	102-09453-01	Vibration Meter	1
22	102-30267-01	Stop Bracket	1
23	102-09399-01	Cap Screw ⅝", Special	1



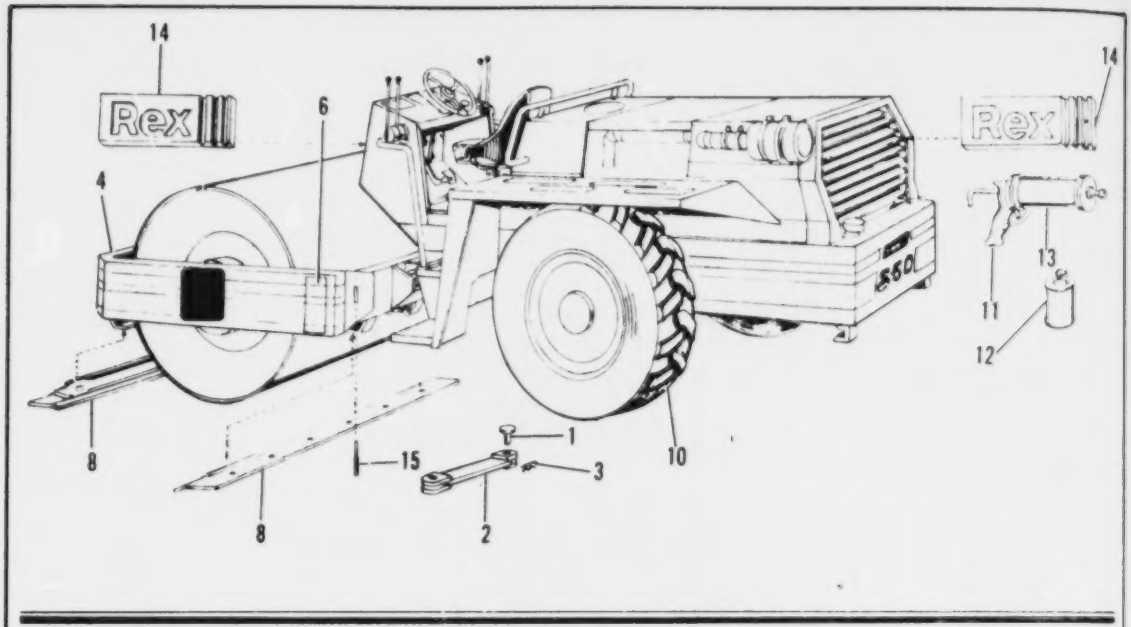
Always Give Serial Number of Machine

FRAME, FENDERS, ENGINE COMPARTMENT, FUEL TANK
OPERATORS SEAT AND PLATFORM
MODEL 848 VIBRATORY ROLLER

Item No.	Part Number	Description	No Req'd.
1	502-7124-80	Main Frame	1
2	502-5997-80	Fuel Tank	1
3	502-2799-80	Filler Cap	1
4	102-7948-1	Tank Support Spacer	2
5	502-2213-81	Tank Strap	4
6	398-99003-38	Cotton Belting $^{3}/_{16}$ x 2 x (Cut to Suit)	2
7	502-6031-80	Operators Platform	1
8	502-2247-80	Seat Mounting Post	1
9	502-4664-80	Operators Seat Support	1
10	502-2822-80	Seat Mounting Plate	1
	398-2003-52	Cap Screw $^{3}/_{8}$ x $^{3}/_{4}$ UNF - 3	4
	398-20000-37	Lock Washer	8
11	298-336-47	Operators Seat	1
12	502-6265-80	Support — Floorboard, Console	1
13	502-6496-80	Fender — L.H.	1
14	502-6496-81	Fender — R.H.	1
15	502-8029-80	Seat Support Post Sleeve	1
16	102-8753-1	Pin	1
17	298-50-47	Spring Pin Lock	1
18	502-4793-80	Handrail — Front (L.H.) as Illustrated	1
	502-4793-81	Handrail — Front (R.H.) Opposite Side	1
19	502-6434-80	Cover — Console	1

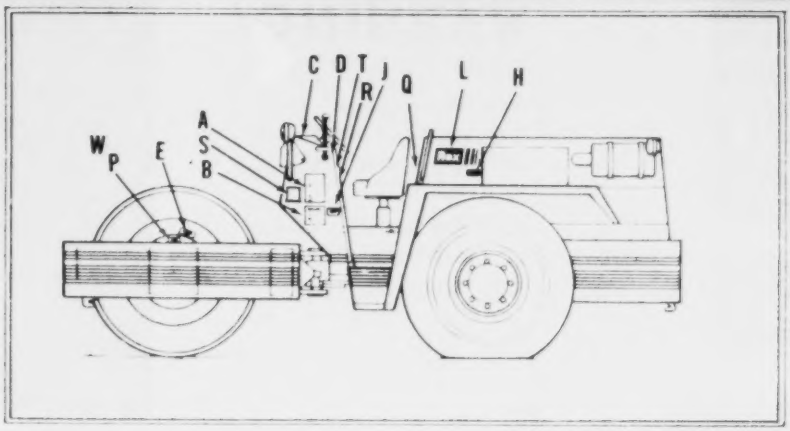
Item No.	Part Number	Description	No Req'd.
21	502-6495-80	Platform Steps (L.H.) as Illustrated	1
	502-6495-81	Platform Steps (R.H.) Opposite Side	1
22	502-4857-81	Rear Handrail (L.H.)	1
23	502-4857-80	Rear Handrail (R.H.)	1
24	502-6452-80	Operators Console	1
25	402-1749-2	Nameplate — Rex	3
26	102-7937-1	Cover	1
27	502-6033-80	Grill	1
28	502-4457-80	Removable Grill	1
29	102-30513-1	Belt Guard	2
30	502-20056-80	Engine Hood	1
31	102-4520-1	Side Panel (L.H.)	1
32	104-4520-2	Side Panel (R.H.)	1
33	502-6334-80	Front Engine & Tank Shell	1
34	502-6268-80	Radiator Shroud	1
35	298-17011-86	Socket Tee 1" Pipe	2
36	102-9266-1	Pipe — Handrail	1
37	502-8082-80	Pin	2
38	502-8081-80	Steering Safety Lock	1
39	298-131-47	Pin	1
	398-3000-25	Cotter $^{3}/_{16}$ x 2½"	1
40	298-5010-92	Strainer	1

(C) FISCHE NO. 7 GRID E-14



REAR DRIVING WHEELS — VIBRATING ROLL SCRAPERS
MODEL 848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
1	502-8082-80	Pin — Steering Safety Lock	2
2	502-8081-80	Steering. Safety Lock Link	1
3	298-131-47	Hair Pin	1
4	502-7107-80	Frame — Vibrating Roller	1
6	102-3655-1	Cover. Frame End	2
8	102-3819-1	Bar-bottom Scraper	2
10	602-10479-1	All Weather Tire and Wheel Assembly Consisting of:	2
	502-6473-80	Wheel Assembly	2
	298-6014-68	All Weather Tire 23.1/18 x 26	2
	298-6023-68	Tube 23.1/18 x 26	2
	298-5534-68	Plug	2
11	298-316-47	Grease Gun	1
12	102-8830-1	Spray Can. 12 oz. Lime Paint	1
13	502-223-80	Grease Tube	1
14	402-1749-1	Name Plate — Rex	2
15	502-8159-80	Guide	2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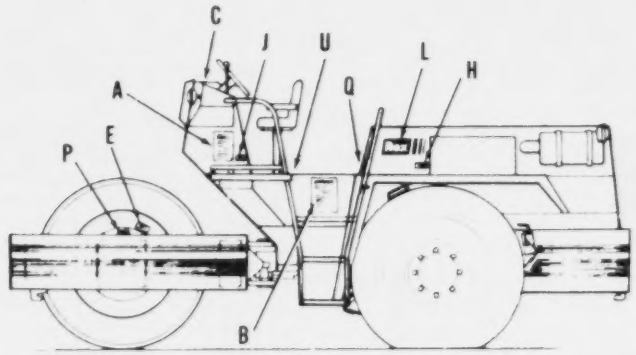
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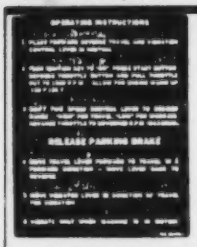

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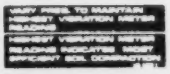

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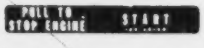

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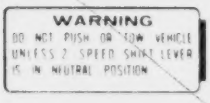

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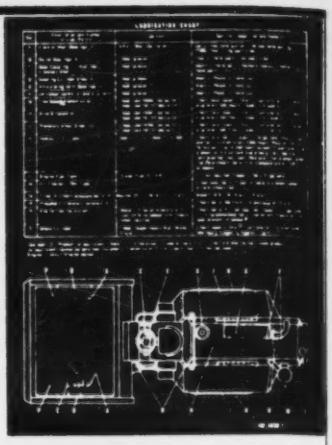
WARNING

CLEARANCE CLOSES

STAND CLEAR AND DO NOT STAND ON LADDER WHEN ENGINE IS RUNNING.

USE STEERING FRAME LOCK WHEN SERVICING MACHINE.

B



A

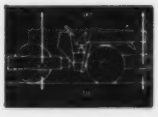
INSTRUCTION PLATES & LABELS

MODELS 848

A	102-04650-01	LUBRICATION PLATE
B	102-04708-01	WARNING LABEL
C	102-30199-01	OPERATING INSTRUCTIONS
D	102-01282-01	SERIAL/MODEL NO. PLATE
E	102-30782-1	LUBRICATION PLATE
F	102-09200-01	VIBRATION LABEL
G	102-30189-01	CONTROL LABEL
H	102-08699-01	FILTER INDICATOR LABEL
I	102-30190-01	ENGINE CONTROL LABEL
J	102-30194-01	WARNING PLATE
K	102-30186-01	FREQUENCY ADJ. STOP LABEL
L	402-01749-02	NAME PLATE – REX
M	102-09222-01	THROTTLE LABEL
N	102-09220-01	LIGHTS LABEL
O	102-08744-01	V.P.M. LABEL, 1800
P	102-09064-01	PNEUMATIC ISOLATOR
Q	102-30193-01	2 SPEED CONTROL
R	A2L-24-245	EAR WARNING PLATE
S	A2L-24-246	LIFT & TIE PLATE
T	A2L-24-247	DATA PLATE

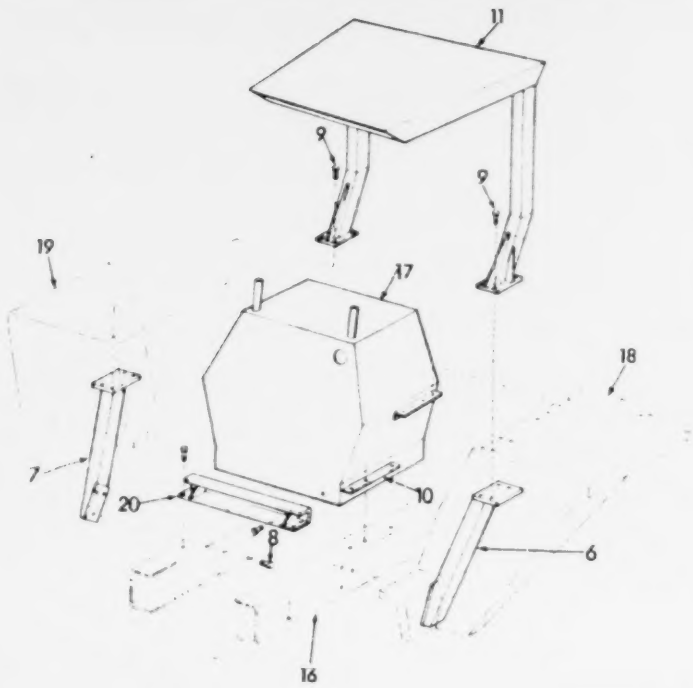
R

S



T

Rexnord
Rexnord Inc
Milwaukee WI 53201



ROLL OVER PROTECTION
MODEL SP848 VIBRATORY ROLLERS

Item No.	Part Number	Description	No. Req'd.
6	502-04855-80	Mount Assy. (L.H.)	1
7	502-04855-81	Mount Assy. (R.H.)	1
8	298-00080-93	Cap Screw H.T. ¾" x 1¾"	6
9	298-81-93	Cap Screw HT. ¾" x 2" (Grade 3)	2
	298-89-93	Cap Screw ¾" x 2½" (Grade 8)	6
10	102-30270-01	Back-up Bar	2
11	102-09414-01	ROPS.	1
16	502-07114-80	Main Frame Ref. Only	
17	502-06334-80	Shell, Front Tank Ref. Only	
18	502-06335-80	Fender (L.H.) Ref. Only	
19	502-06335-81	Fender (R.H.) Ref. Only	
20	502-08206-80	Upper Cross Member	1
21	102-9623-1	Seat Belt Kit (Not Illustrated)	1

(C) FISCHE NO. 7 GRID E-18

SECTION III

REPAIR PARTS

FOR

VIBRATORY ROLLER ENGINE ASSEMBLY

REGISTRATION NUMBERS UBOOFL TO UBOOHF

SP 848

NSN 3895-01-075-2823

GENERAL INFORMATION

General Information

All engine components are divided into twelve major groups of functionaly related parts. A list of the groups appears in the index of this manual.

Within each group different design of similar equipment are shown, each group uses a type number. The type number in one group has no relationship to the type number of another group.

All optional material type numbers are shown on the engine Option Plate. The plate is shown in the illustration below.

The names and type numbers of optional equipment built into the unit at the factory are listed on this plate, along with the unit model, serial number and custom specification (if any). Material not listed on the Option Plate is standard equipment. (Copies of the information, on the Option Plate Work Sheet, are furnished to distributors for their files.)

To locate a part establish the group where the part is used (see index page). Turn to the page listed for that group. Locate the part on the illustration. Locate the index number in the parts list and the part number will be listed along with an item description. The quantity column is the number of times the part is used in the assembly shown.

YOUR PARTS ORDER WILL BE HANDLED MORE EFFICIENTLY IF:

1. The following information is provided for the item ordered:
   - A. Group in the parts book in which it is listed
   - B. Quantity desired
   - C. Item part number
   - D. Complete item description
   - E. Complete unit model identification and serial number
2. "TYPE" rather than "WRITE" the above information

MISCELLANEOUS

Unless otherwise specified, standard bolts in the parts list are hexagon head. Other standard parts are described in detail.

The information and illustrations in this publication are based on the information in effect at the time of printing.

ENGINE OPTION PLATE

TABLE OF CONTENTS

GROUP NAME	GROUP NO.	TYPE	PAGE NO.
Cylinder Block	1,1000	29	5
Air Box Drains	1,1000A	63	5
Cylinder Head	1,2000	23	11
Engine Lifter Bracket	1,2000A	175	13
Crankshaft	1,3000	50	7
Crankshaft Front Cover	1,3000A	119	15
Crankshaft Pulley	1,3000C	133	7
Flywheel	1,4000A	324	17
Flywheel Housing SAE # 4	1,5000A	178	17
Connecting Rod and Piston	1,6000	61	19
Camshaft and Gear Train	1,7000	220	9
Valve Operating Mechanism	1,8000	30	13
Rocker Cover	1,8000A	38	21
Fuel Injector N50	2,1000A	77	23
Fuel Pump	2,200	127	25
Fuel Filter	2,3000A	157	27
Fuel Manifold Connections	2,4000	48	29
Fuel Lines	2,5000A	499	29
Mechanical Governor	2,7000A	1122	31
Injector Controls	2,9000	279	35
Throttle Controls	2,9000A	595	37
Air Inlet Housing	3,3000A	595	39
Blower	3,4000	114	41
Oil Pump	4,1000A	49	43
Oil Distribution System	4,1000B	235	43
Oil Pressure Regulator	4,1000C	9	
Oil Filter	4,2000A	226	45
Oil Cooler	4,4000A	230	45
Oil Filler Cap	4,5000A	44	47
Dipstick	4,6000A	253	49
Oil Pan	4,7000A	584	49
Ventilating System	4,8000A	197	47
Fresh Water Pump	5,1000	145	51
Water Outlet Elbow	5,2000A	67	51
Thermostat	5,2000B	72	53
Water By-Pass Tube	5,2000C	318	51
Water Connections	5,3000B	117	53
Fan	5,4000A	281	55
Exhaust Manifold	6,1000A	411	57
Gasket Exhaust Muffler Flange	6,2000A	253	57
Battery Charging Generator	7,1000A	1777	59
Starting Motor	7,3000A	174	59
Tachometer Drive	7,4000B	547	61

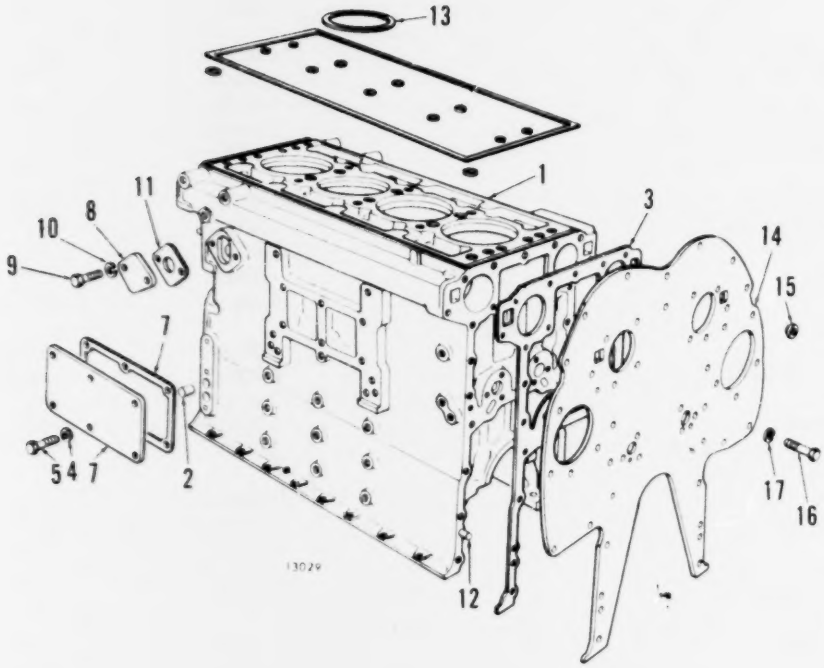


FIG. 1 - CYLINDER BLOCK

1.1000 CYLINDER BLOCK

FIG/INDEX	PART NO.	NAME	QTY
1- 1	5196490	BLOCK ASSY.	1
2- 1	5116142	. CAP, MAIN BEARING	4
3- 1	5198209	. BEARING SET, CAMSHAFT	1
2- 2	5116199	. BOLT, MAIN BEARING CAP	8
-	5146437	. ELBOW, AIR BOX DRAIN TEE	1
-	3231135	. TEE, 1/4'' INV. FL.	1
1- 12	141346	. PIN, 3/16''X1/2'' DOWEL	4
1- 2	5146900	. PIN, 3/8''X1 1/8'' DOWEL	4
-	114981	. DRAINCOCK, 1/8''	1
2- 4	5145009	. PLUG, 1/8'' PIPE	7
-	5121182	. PLUG, 1/4'' PIPE	1
-	5150131	. PLUG, 7/16'' CUP	2
-	5121316	. PLUG, 5/8''X13/32''	2
-	443762	EXTENSION TUBE	1
-	5199791	GASKET KIT	AR
4- 1	5121365	PLATE ASSY.	1
1- 14	5121366	PLATE ASSY.	1
1- 15	5121459	. NUT, PLUG 3/8''-24	8
1- 16	9409079	BOLT, 3/8''-16X7/8''	13
1- 17	103321	LOCKWASHER, 3/8''	AR
1- 3	5116354	GASKET	1
1- 4	5116373	COVER	1
1- 5	180120	BOLT, 3/8''-16X3/4''	6
1- 6	103321	LOCKWASHER, 3/8''	6
1- 7	5116380	GASKET	1
1- 8	5164190	COVER (1/4'' TAPPED HOLE)	1
1- 8	5115097	COVER (3/8'' TAPPED HOLE)	1
1- 8	5189143	COVER (1/2'' TAPPED HOLE)	1
1- 8	5150023	COVER (PLAIN)	1
1- 9	186618	BOLT, 5/16''-18X5/8''	2
1- 9	186625	BOLT, 5/16''-18X7/8''	2
1- 10	103320	LOCKWASHER, 5/16''	2
1- 11	5116357	GASKET	1

1.1000A AIR BOX DRAINS

FIG/INDEX	PART NO.	NAME	QTY
5- 1'	5132286	TUBE	1
-	225810	ELBOW, 1/4'' INV. FL. TUBE 90 DEG.	1
-	137397	NUT, 1/4'' INV. FL. TUBE	1

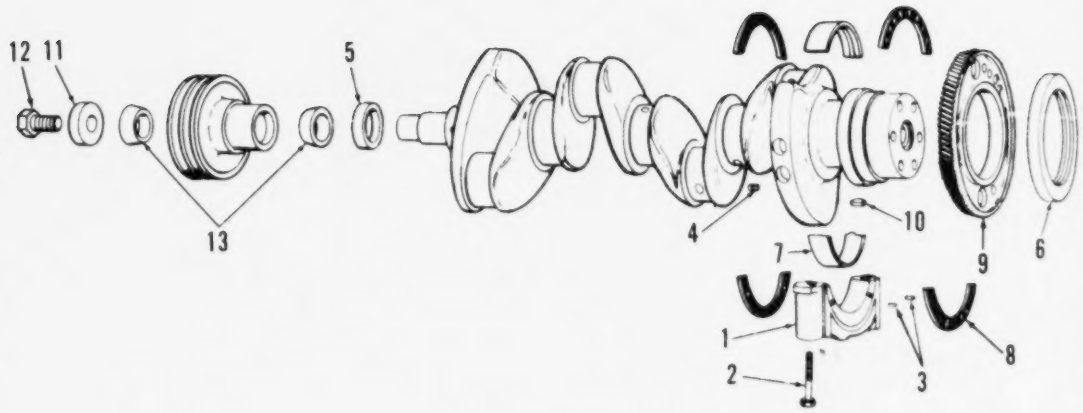


FIG. 2 - CRANKSHAFT

1.3000 CRANKSHAFT

FIG/INDEX	PART NO.	NAME	QTY
4- 2	5116447	CRANKSHAFT ASSY.	1
2- 4	444687	. PLUG, 1/8'' PIPE	3
2- 5	5116224	SEAL	1
9- 3	5198503	SEAL, SINGLE LIP O.S.-USE WITH 5198502 SLEEVE	1
9- 2	5148314	SEAL	1
9- 2	5198502	SLEEVE (USE WITH 5198503 SEAL)	1
11- 4	5116224	SEAL	1
2- 6	5116229	SEAL (SINGLE LIP, STANDARD)	1
2- 6	5128917	SEAL (DOUBLE LIP, STANDARD)	1
2- 6	5196852	SEAL (SINGLE LIP, O.S., USE WITH 5196851 SLEEVE)	AR
2- 6	5199477	SEAL (DOUBLE LIP, O.S., USE WITH 5196851 SLEEVE)	AR
-	5196851	SLEEVE (WITH O.S. OIL SEAL)	AR
2- 7	5195928	SHELL SET	AR
2- 7	5196660	SHELL SET (.002'' U.S.)	AR
2- 7	5196661	SHELL SET (.010'' U.S.)	AR
2- 7	5196662	SHELL SET (.020'' U.S.)	AR
2- 7	5196663	SHELL SET (.030'' U.S.)	AR
2- 8	5116197	WASHER	4
2- 8	5196755	WASHER (.005'' O.S.)	AR
2- 8	5196756	WASHER (.010'' O.S.)	AR
2- 3	141346	PIN, 3/16''X1/2'' DOWEL	4
2- 3	5149149	PIN, 7/32''X1/2'' DOWEL	AR
2- 1	5195935	CAP	4
2- 1	5116142	CAP	AR
2- 2	5116199	BOLT	8
2- 9	5116195	GEAR	1
2- 10	127559	KEY, 1/4''X3/4'' WOODRUFF	1

1.3000C CRANKSHAFT PULLEY

FIG/INDEX	PART NO.	NAME	QTY
12- 1	5126687	PULLEY (5.38'' DIA., 2 GROOVES)	1
2- 11	5180291	RETAINER (WASHER)	1
2- 12	5180629	BOLT, 3/8''-16X1 3/4''L.	1
2- 12	271632	BOLT, 3/4''-16X1 3/4''	1
2- 13	5119189	CONE	2

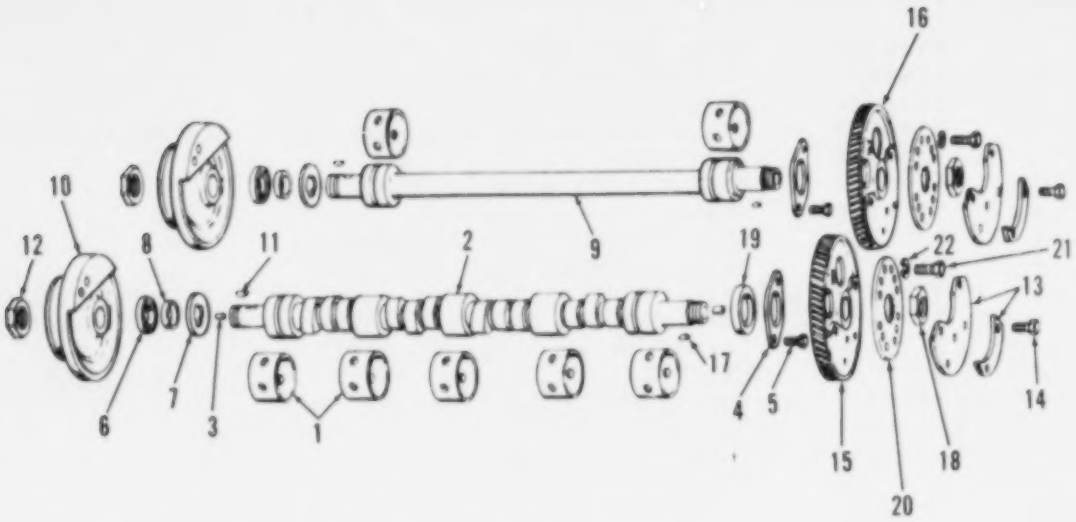


FIG. 3 - CAMSHAFT

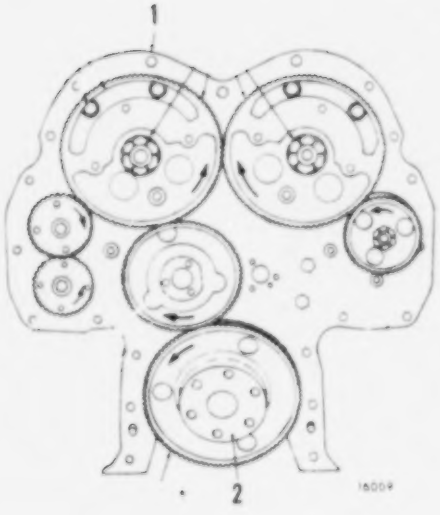


FIG. 4 - GEAR TRAIN

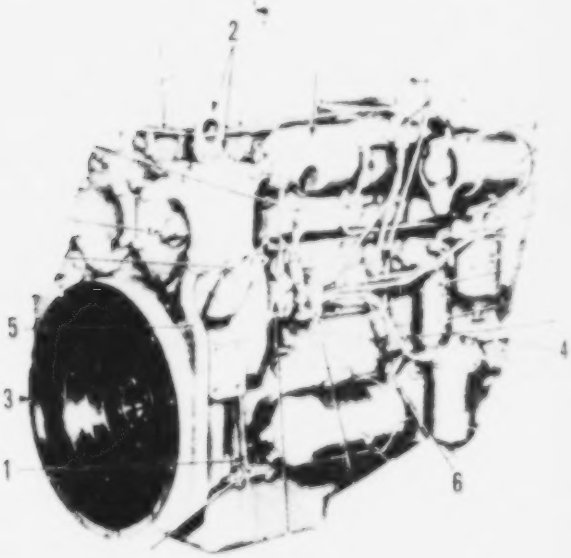


FIG. 5 - TYPICAL FAN TO FLYWHEEL

1.7000 CAMSHAFT AND GEAR TRAIN

FIG/INDEX	PART NO.	NAME	QTY
3- 2	5126929	CAMSHAFT ASSY.	1
3- 3	5151277	. PLUG (1/2'' DRIVE)	2
3- 1	5198209	BEARING SET	1
3- 1	5198980	BEARING SET (STD.I.D., O.D.)	AR
3- 1	5198470	BEARING SET (.010''U.S., I.D., STD. O.D.)	AR
3- 1	5198471	BEARING SET (.020''U.S., I.D., STD. O.D.)	AR
3- 4	5116198	WASHER	2
3- 5	9409028	BOLT, 3/8''-16X1''	4
3- 6	5106223	SEAL, OIL (FRONT)	2
3- 7	5134388	SLINGER	2
3- 8	5121071	SPACER	2
3- 9	5121073	SHAFT	1
3- 10	5121108	PULLEY	2
3- 11	218217	KEY, 3/16X5/8'' WOODRUFF	2
3- 12	5150087	NUT	2
3- 13	5119277	WEIGHT	2
3- 14	9409028	BOLT, 3/8''-16X1'' LOCK	4
3- 15	5133387	GEAR (R.H. HELIX)	1
3- 16	5133388	GEAR (L.H. HELIX)	1
3- 17	218217	KEY, 3/16''X5/8'' WOODRUFF	2
3- 18	5150087	NUT	2
3- 19	5121077	SPACER	1
3- 20	5172734	RETAINER	2
3- 21	181360	BOLT, 3/8''-24X3/4''	4
3- 22	103321	LOCKWASHER, 3/8''	4
15- 6	5135227	GEAR ASSY., IDLER	1
15- 1	5196793	. BEARING	1
15- 2	5132504	. WASHER (THRUST)	2
15- 3	5124458	. HUB	1
15- 4	5157244	. BOLT	1
15- 5	5116220	SPACER	1

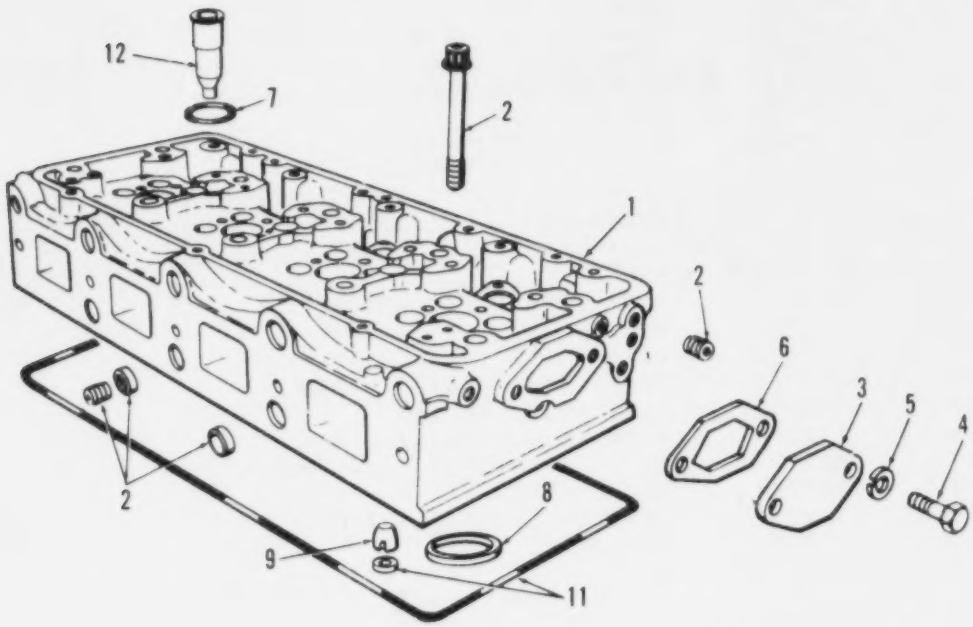


FIG. 6 - CYLINDER HEAD ASSY

1.2000 CYLINDER HEAD

FIG/INDEX	PART NO.	NAME	QTY
6- 1	5198203	HEAD ASSY.	1
6- 2	5198655	. PLUG, FUSE	1
6- 2	5154453	. PLUG, 3/8''-16 SPECIAL	4
6- 2	5145009	. PLUG, 1/8'' PIPE	2
6- 10	5150041	. TUBE, INJECTOR HOLE	3
-	5199527	. TUBE KIT (INCLUDES RING 5160037)	3
6- 7	5104701	. RING	3
-	5116361	. INSERT, EXHAUST VALVE	12
-	5131961	. GUIDE, EXHAUST VALVE	12
6- 1	5119293	. NOZZLE, WATER (DOUBLE OUTLET)	4
-	5121182	. PLUG, 1/4'' PIPE	6
-	5144425	. ADAPTOR, CYLINDER HEAD FUSE PLUG	1
-	5116262	. ADAPTOR, CYLINDER HEAD GOVERNOR CONTROL LINK	1
-	5121252	. ADAPTOR, CYLINDER HEAD GOVERNOR CONTROL LINK	1
7- 1	5111467	. SEAT, EXHAUST VALVE SPRING	12
-	5139997	PLUG, 7/8'' DIA. CUP	3
6- 11	5199811	GASKET KIT	AR
6- 9	5119293	NOZZLE	4
2- 13	5121254	GASKET	3
-	5116290	RING, SEAL (END WATER HOLE)	4
-	5121207	RING, SEAL (CENTER WATER HOLE)	4
-	5116122	RING, SEAL (OIL HOLE)	2
-	5116292	RING, SEAL	1
6- 3	5121263	BOLT, 5/8''-11X6 1/4'' (12 PT. HD.)	8
6- 3	5136610	COVER (USE 3/8''-16X1'' BOLT)	1
6- 3	5123168	COVER (1/8'' PIPE TAP, CENTERED)	1
6- 3	5127837	COVER (1/8'' PIPE TAP, OFF CENTER)	1
6- 3	5139226	COVER (1/8''X3/8'' PIPE TAP)	1
6- 3	5129019	COVER (1/4'' PIPE TAP)	1
6- 3	5123352	COVER (3/8'' PIPE TAP)	1
6- 3	5109707	COVER (1/4'' AND 1/2'' PIPE TAPS)	1
-	103877	PLUG, 1/8'' PIPE SQ. HD.	1
-	5121182	PLUG, 1/4'' PIPE	2
-	5145014	PLUG, 3/8'' PIPE SQ. HD.	1
-	5115214	PLUG, 1/2'' PIPE SQ. HD.	1
6- 4	179839	BOLT, 3/8''-16X1''	2
6- 5	103321	LOCKWASHER, 3/8''	2
6- 6	5116242	GASKET	1
6- 12	5199527	TUBE KIT	3
6- 7	5104701	RING	3

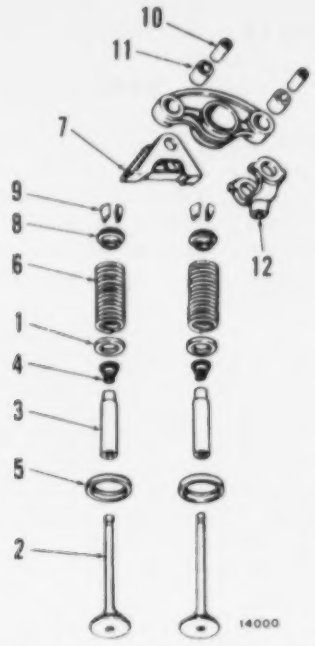


FIG. 7 - 4 VALVE (WITH BRIDGE)

FIG. 8 - LIFTER BRACKETS

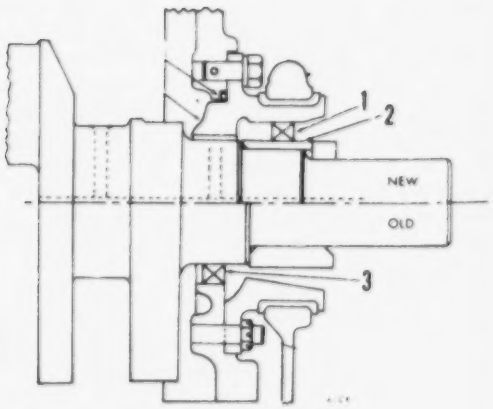


FIG. 9 - CRANKSHAFT

1.8000 VALVE OPERATING MECHANISM

FIG/INDEX	PART NO.	NAME	QTY
16- 1	5135268	ARM ASSY., ROCKER	3
16- 1	5135267	ARM ASSY., ROCKER	3
16- 2	5179954	ARM ASSY., ROCKER	3
16- 3	5150318	. BUSHING	3
16- 4	5150311	. BUSHING	3
16- 5	5150312	. CLEVIS	9
16- 6	5123700	. BUSHING	15
16- 7	5150314	. PIN (CLEVIS END)	9
16- 7	5123711	. PIN (BRIDGE END)	6
16- 8	5116072	SHAFT ASSY.	3
16- 8	5151272	. PLUG	3
16- 9	5116128	BRACKET	6
16- 10	5119198	BOLT	6
16- 11	5128640	ROD, PUSH	9
16- 12	5151601	LOCKNUT	9
16- 13	5108918	SPRING	9
16- 14	5108919	SEAT (VALVE AND INJECTOR)	9
16- 15	5123250	SEAT	9
16- 16	5150303	RETAINER (SNAP RING)	9
16- 17	5115087	FOLLOWER ASSY. (INCLUDES ROLLER SET)	9
-	5195220	. ROLLER SET (STANDARD) (INCLUDES ROLLER W/BUSHING AND PIN)	9
16- 18	5116125	GUIDE	3
16- 19	443603	BOLT, 1/4''-20X3/4''	6
16- 20	103319	LOCKWASHER, 1/4''	6
7- 2	5199323	VALVE	12
7- 3	5131961	GUIDE	12
-	5198529	KIT, VALVE GUIDE AND SEAL	12
7- 4	5131973	SEAL, VALVE GUIDE (USE WITH 5131961)	12
-	5199912	INSTALLER, EXHAUST VALVE SEAL	AR
7- 5	5116361	INSERT (STANDARD)	12
7- 5	5196752	INSERT(.010'' OVERSIZE ON O.D.)	AR
7- 6	5144019	SPRING (RED AND GREEN STRIPE)	12
7- 7	5135262	BRIDGE	6
7- 8	5123330	CAP	12
-	5125922	SEAT (.150'' THICK)	12,
7- 9	5116341	LOCK (HALVES)	24
7- 10	5123711	PIN, (BRIDGE END)	1
7- 11	5123700	BUSHING	1
7- 12	5150312	CLEVIS	1

1.2000A ENGINE LIFTER BRACKET

FIG/INDEX	PART NO.	NAME	QTY
-	5129750	BRACKET	1
-	5164294	SPACER, 1/8'' THICK	2
-	9409028	BOLT, 3/8''-16X1'' AA LOCK	2
8- 7	5119379	BRACKET (ALSO FIG 5 ITEM 2)	1
-	9409028	BOLT, 3/8''-16X1''	2

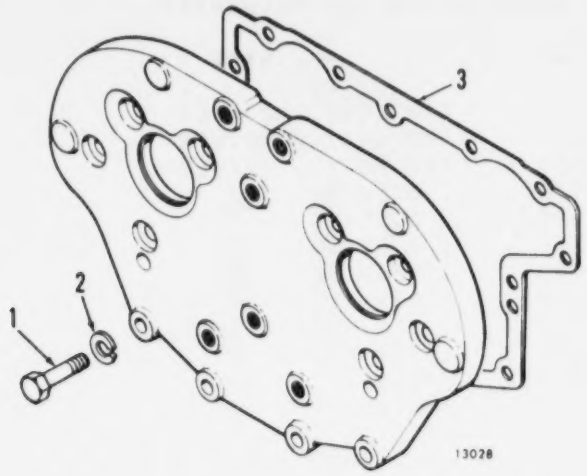


FIG. 10 - UPPER FRONT COVER

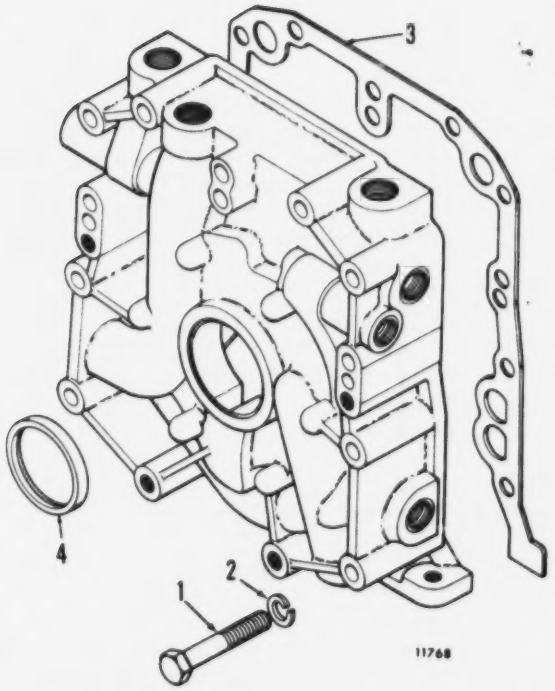


FIG. 11 - LOWER FRONT COVER

1.3000A CRANKSHAFT FRONT COVER

FIG/INDEX	PART NO.	NAME	QTY
10-	5101347	COVER ASSY., ENGINE FRONT UPPER	1
-	5146900	. PIN, 3/8''X1 1/8'' DOWEL	2
10- 1	186622	BOLT, 3/8''-16X1 1/4''	9
10- 1	179844	BOLT, 3/8''-16X1 5/8''	4
-	9414322	WASHER, 3/8'' I.D. X THICK	13
10- 2	103321	LOCKWASHER, 3/8''	13
11-	5197415	COVER ASSY., ENGINE FRONT LOWER	1
-	5145009	PLUG, 1/8 PIPE	1
-	5146648	PLUG, 1/2 PIPE	7
11- 1	186282	BOLT, 3/8''-16X3 1/4''	7
11- 2	103321	LOCKWASHER, 3/8''	7
10- 3	5121082	GASKET	1
11- 3	5116386	GASKET	1
11- 4	5116224	SEAL	1

FIG. 12 - CRANKSHAFT PULLEY

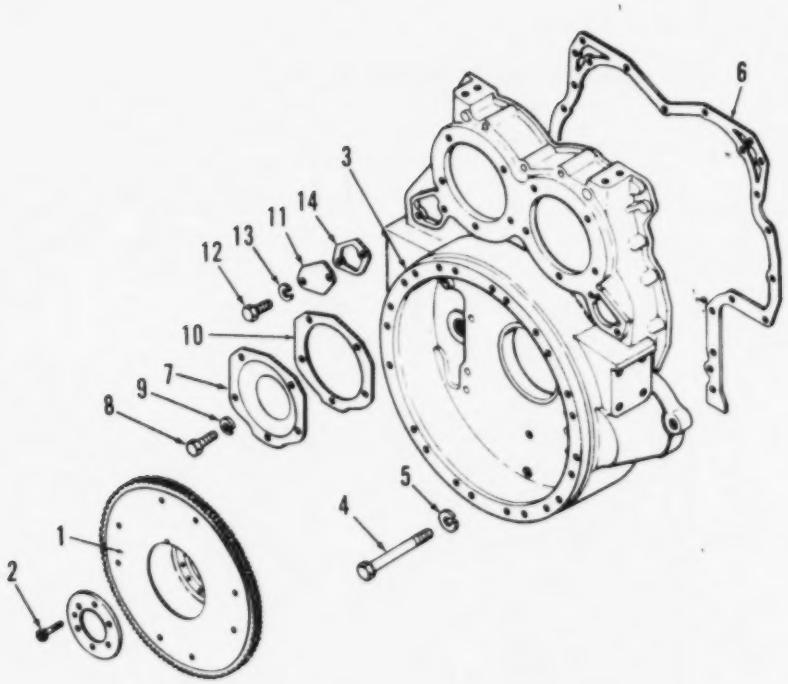


FIG. 13 - FLYWHEEL AND FLYWHEEL HOUSING

1.4000A FLYWHEEL

FIG/INDEX	PART NO.	NAME	QTY
13-	5119418	FLYWHEEL ASSY. (SAE #4, NON-CHAMFERED) INCLUDES 5116289 GEAR	1
13- 2	9412018	BOLT, LOCK (2 1/4'' L.)	6
13- 1	5116289	GEAR (SAE #4-111 TEETH)	1

1.5000A FLYWHEEL HOUSING

FIG/INDEX	PART NO.	NAME	QTY
13- 3	5119351	HOUSING, (SAE #4) (ALSO FIG 5 ITEM 3)	1
-	5116220	SPACER	1
-	5157244	BOLT	1
13- 4	9409126	BOLT, 5/16-18X2 1/2	AR
13- 4	5101779	BOLT, 3/8''-16X7/8''	1
13- 4	180121	BOLT, 3/8''-16X7/8''	5
13- 4	9414215	BOLT, 3/8-16X2 1/2	4
13- 4	179849	BOLT, 3/8''-16X2 1/2''	6
13- 4	5170489	BOLT, 3/8-24X3 9-16 LOCK	3
13- 5	103321	LOCKWASHER, 3/8''	AR
13- 6	5121334	GASKET	1
13- 7	5122281	COVER	2
13- 8	179857	BOLT, 7/16''-14X7/8''	2
13- 8	122408	BOLT, 1/2''-13X1''	8
-	5150568	WASHER,(7/16'' COPPER)	2
13- 9	103323	LOCKWASHER, 1/2''	8
13- 10	5104506	GASKET	2
13- 11	5116411	COVER	2
13- 12	186625	BOLT, 5/16''-18X7/8''	4
13- 13	103320	LOCKWASHER, 5/16''	4
13- 14	5116391	GASKET	2
-	5130995	GASKET	AR

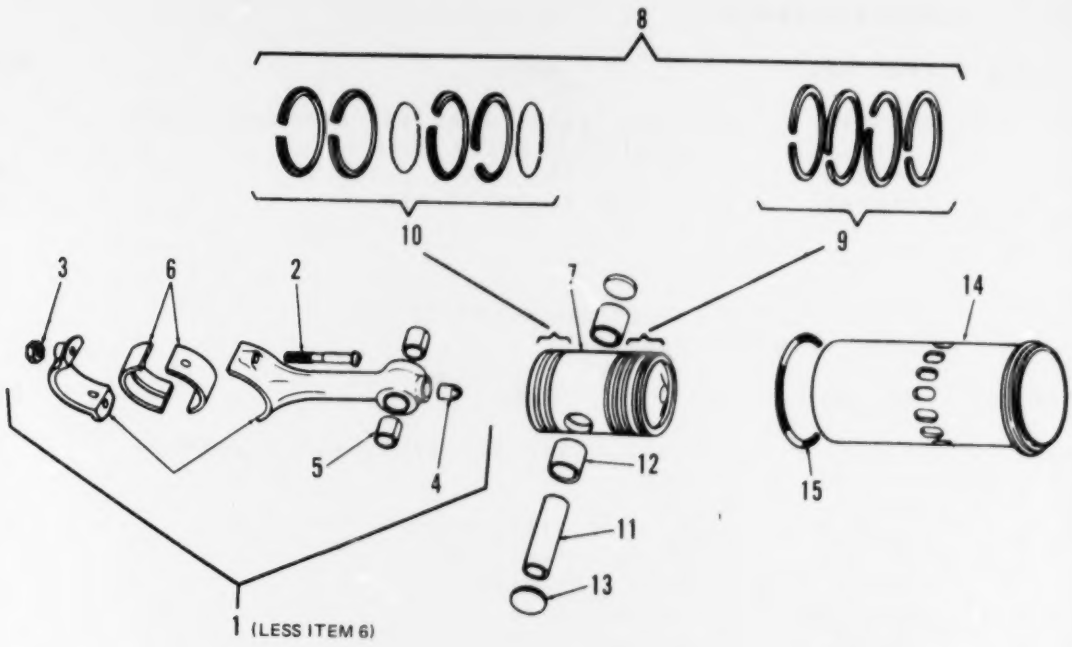


FIG. 14 - CONNECTING ROD, PISTON AND LINER

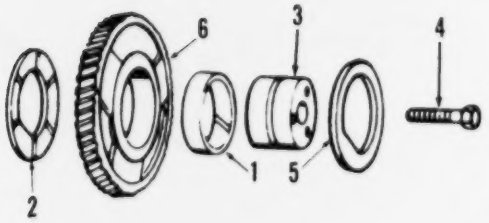


FIG. 15 - IDLER GEAR

1.6000 CONNECTING ROD AND PISTON

FIG/INDEX	PART NO.	NAME	QTY
14- 1	5121262	ROD ASSY. (INCLUDES CAP AND ORIFICE NOT SOLD SEPARATELY)	1
14- 2	5197852	. BOLT, 3/8''-24X2.76''L.	2
14- 3	839103	. NUT (3/8''-24 HEX.)	2
14- 4	5150140	. NOZZLE	1
14- 5	5116181	. BUSHING	2
14- 6	5195929	SHELL SET (STANDARD) (SHELL SETS HAVE (1) UPPER AND (1) LOWER SHELL)	AR
-			
14- 6	5196664	SHELL SET (.002''U.S.)	AR
14- 6	5196665	SHELL SET (.010''U.S.)	AR
14- 6	5196666	SHELL SET (.020''U.S.)	AR
14- 6	5196667	SHELL SET (.030''U.S.)	AR
14- 7	5198877	PISTON ASSY. (CONTAINS (1) 5116181 BUSHING AND (1) 5180250 RETAINER	1
-			
14- 8	5198822	RING SET (SUFFICIENT RINGS FOR ONE CYLINDER)	AR
14- 9	5103382	RING (FIRE RING)	1
14- 9	5116184	RING (SECOND, THIRD, AND FOURTH)	3
14- 10	5195933	RING (UPPER AND LOWER GROOVE)	2
14- 11	5116189	PIN	1
14- 12	5116181	BUSHING	2
14- 13	5180250	RETAINER	2
14- 14	5132803	LINER (STANDARD)	1
14- 14	5101016	LINER (.010'' O.S., O.D.)	AR
-	5198899	CYLINDER KIT	AR
14- 15	5121256	SEAL	1

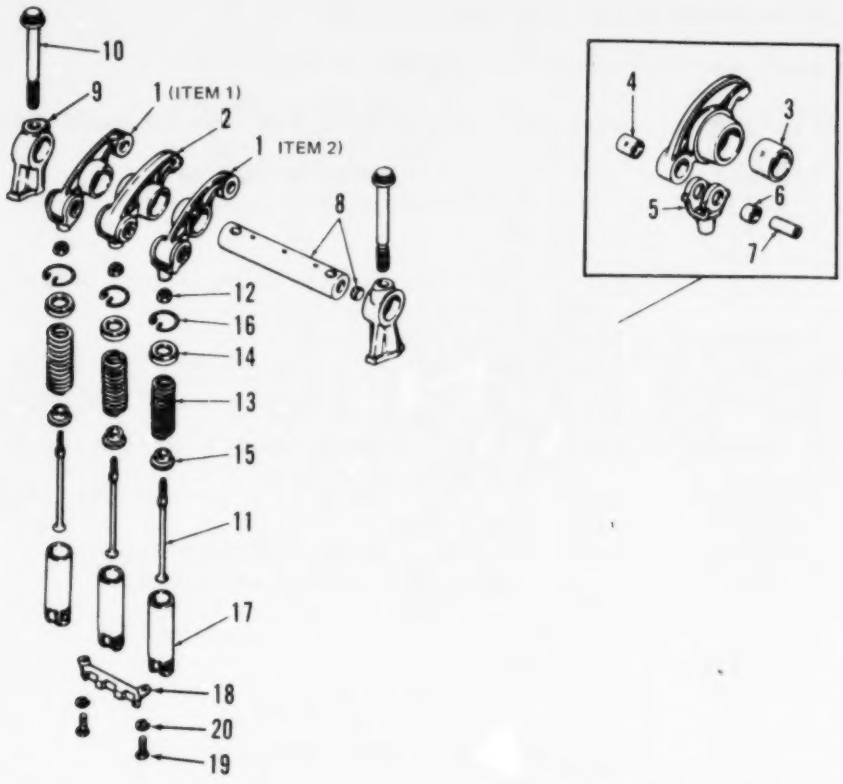


FIG. 16 - VALVE AND INJECTOR OPERATING MECHANISM

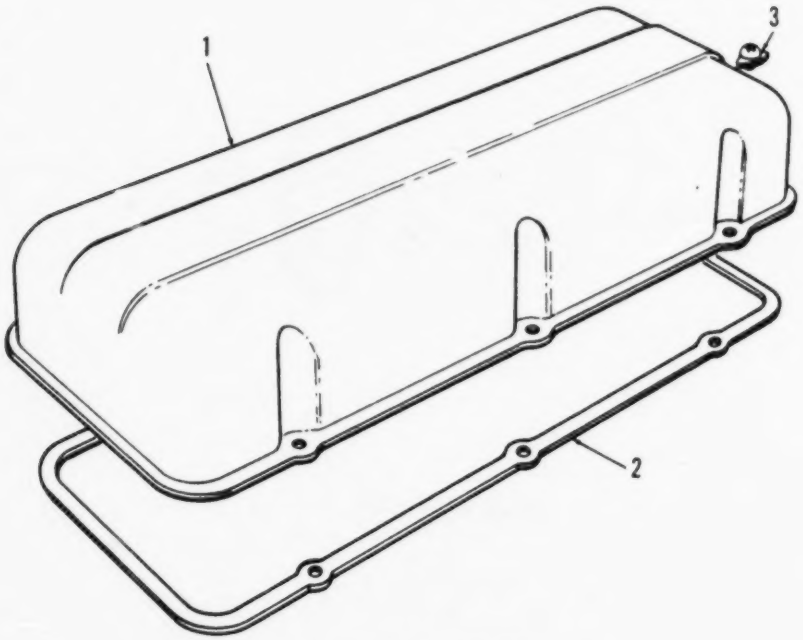


FIG. 17 - ROCKER COVER

1.8000A ROCKER COVER

FIG/INDEX	PART NO.	NAME	QTY
17- 1	5125356	COVER	1
17- 2	5147994	GASKET	1
17- 3	5100104	SCREW ASSY.	4
-	5104203	PLATE	AR

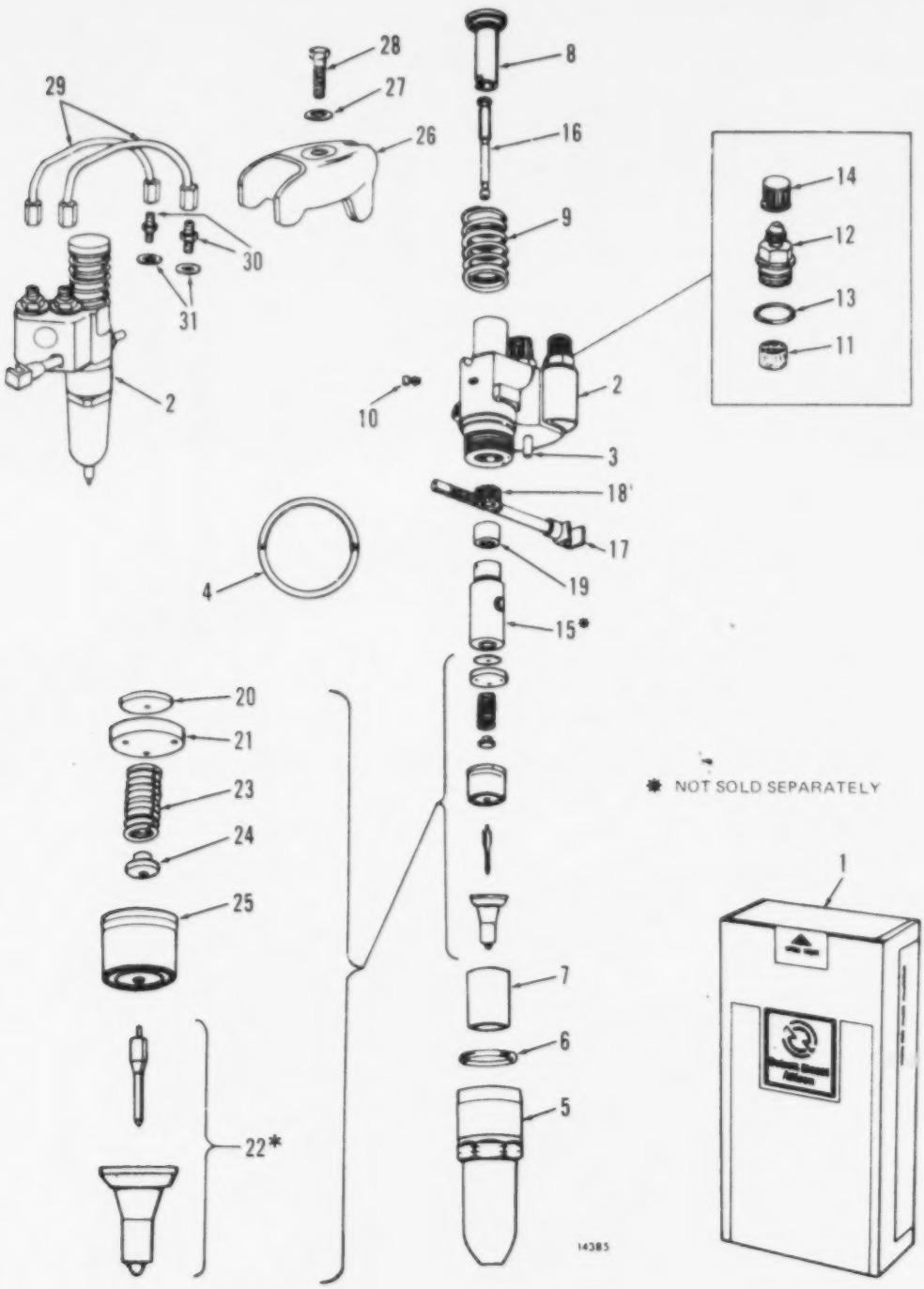


FIG. 18 - FUEL INJECTOR

2.1000A FUEL INJECTOR

FIG/INDEX	PART NO.	NAME	QTY
18-	5228783	INJECTOR ASSY. (INCLUDES ITEMS 5229649 THRU 5228594)	1
-	5229649	OVERHAUL KIT: (1) SEAL RING, (2) FILTER CAP GASKETS, (2) FILTER ELEMENTS & (2) SHIPPING CAPS.	AR
18- 1	5193171	CONTAINER	AR
18- 2	5228583	BODY ASSY.	1
18- 3	5226416	. DOWEL	1
-	5226912	. PLUG, BODY	2
18- 4	5228772	TAG, NUMBER	1
18- 5	5228601	NUT	1
18- 6	5229167	RING	1
18- 7	5228109	DEFLECTOR	1
18- 8	5228104	FOLLOWER	1
18- 9	5228739	SPRING	1
18- 10	5228608	PIN	1
18- 11	5228587	ELEMENT	1
18- 12	5228588	CAP	2
18- 13	5226186	GASKET	2
18- 14	5226414	CAP	AR
18- 15	5228749	PLUNGER AND BUSHING ASSY.	1
18- 16	5226393	. PIN	1
18- 17	5226719	RACK	1
18- 18	5226400	GEAR	1
18- 19	5228586	RETAINER	1
18- 20	5228694	VALVE	1
18- 21	5228696	CAGE	1
18- 22	5229034	TIP ASSY.: NOT SERVICED, USE 5229034 OR 5228768 TIP ASSY & INCLUDE 5228766 SEAT	1
-	5228769	VALVE KIT (SHORT QUILL NEEDLE)	AR
18- 23	5228596	SPRING	1
18- 24	5228766	SEAT	1
18- 25	5228594	CAGE	1
18- 26	5121259	CLAMP	1
18- 27	5150250	WASHER	1
18- 28	180130	BOLT, 3/8''-16X2''	1
18- 29	5116204	PIPE ASSY (QTY IS TWO TIMES CYLINDER COUNT)	1
18- 30	5152138	CONNECTOR (QTY IS TWO TIMES CYLINDER COUNT)	1
18- 31	5152148	WASHER (QTY IS TWO TIMES CYLINDER COUNT)	1

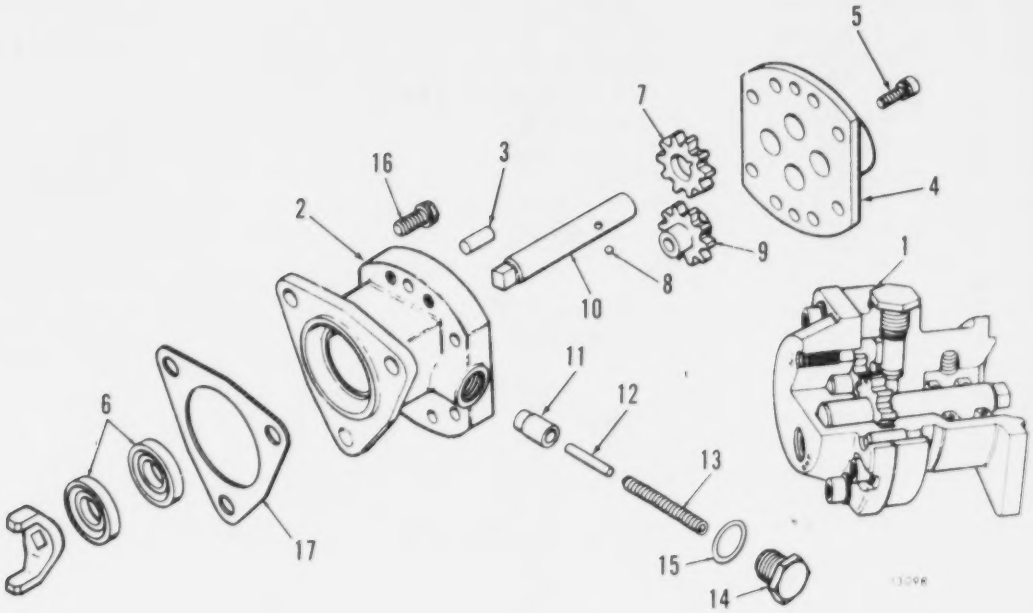


FIG. 19 - FUEL PUMP

2.2000 FUEL PUMP

FIG/INDEX	PART NO.	NAME	QTY
19- 1	5146341	PUMP ASSY NOT SERVICED; USE PART NO. 5199560	1
19- 2	5146337	. BODY	1
19- 3	141195	. PIN, 1/4''X5/8'' DOWEL	2
19- 4	5134560	. COVER	1
19- 5	3719219	. BOLT, 1/4''-20X3/4'' (WITH LOCKWASHER)	8
19- 6	5230007	. SEAL	2
19- 7	5174975	. GEAR	1
19- 8	147481	. BALL, 1/8'' DIA. STEEL	1
19- 9	5181747	. SHAFT ASSY. (INCLUDES GEAR)	1
19- 10	5181746	. SHAFT ASSY. (INCLUDES GEAR AND BALL)	1
19- 10	5178700	. SHAFT	1
19- 11	5174973	. VALVE	1
19- 12	103709	. PIN, 5/32''X1'' STRAIGHT	1
19- 13	5184530	. SPRING	1
19- 14	5174971	. PLUG	1
19- 15	5161003	. GASKET	1
-	5199560	PUMP KIT, FUEL (INCLUDES 3/8'' INLET PUMP, GASKET, REDUCING BUSHING)	1
19- 16	5131685	BOLT, 5/16''-18X3/4'' (WITH NYLOC INSERT)	3
-	5195078	OVERHAUL KIT	AR
19- 17	5150193	GASKET	1
-	5154216	COUPLING	1

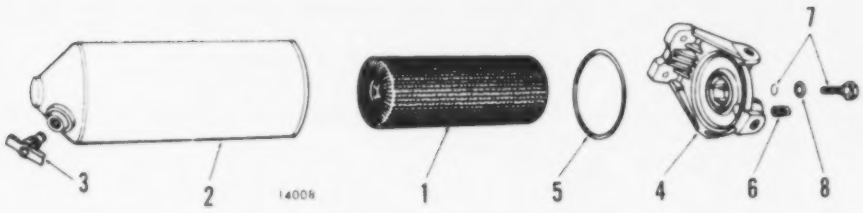


FIG. 20 - FUEL STRAINER (STOCK TYPE ELEMENT)

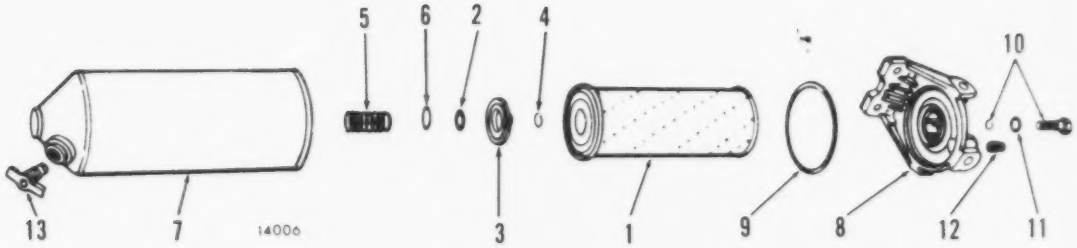


FIG. 21 - FUEL FILTER (CANISTER TYPE ELEMENT)

2.3000A FUEL FILTER

FIG/INDEX	PART NO.	NAME	QTY
20-	5575568	STRAINER ASSY. (6'')	1
20- 1	5574961	. ELEMENT (6'', FELT SOCK TYPE)	1
20- 2	5577586	. SHELL	1
20- 3	103647	. DRAINCOCK, 1/4''	1
20- 4	6436253	. COVER ASSY.	1
20- 5	5574161	. GASKET	1
20- 6	5121182	. PLUG, 1/4'' PIPE	2
20- 6	5145014	. PLUG, 3/8'' PIPE	2
20- 7	6435793	. BOLT	1
20- 8	6435794	. GASKET	1
-	5575197	DECAL (WITH 5575568 STRAINER)	1
-	444692	PLUG, 1/4''	2
-	186619	BOLT, 3/8''-16X1 1/8''	2
-	133341	WASHER, 3/8'' FLAT	2
-	103321	LOCKWASHER, 3/8''	2
21-	5573949	FILTER ASSY. (4'')	1
21- 1	5573261	. ELEMENT (4'')	1
21- 2	5574123	. SEAT	1
21- 3	5574126	. SEAL	1
21- 4	5574120	. RETAINER (RING)	1
21- 5	5574124	. SPRING	1
21- 6	5574122	. SEAT, SPRING (WASHER)	1
21- 7	5574125	. SHELL ASSY.	1
21- 8	6436254	. COVER ASSY.	1
21- 9	5574161	. GASKET	1
21- 10	5574118	. SCREW	1
21- 11	1503536	. GASKET	1
21- 12	5121182	. PLUG, 1/4'' PIPE	2
21- 13	103647	. DRAINCOCK, 1/4''	1
-	5574083	DECAL	1
-	181374	BOLT, 3/8''-24X1 1/2''	2
-	117049	NUT, 3/8''-24 HEX.	2

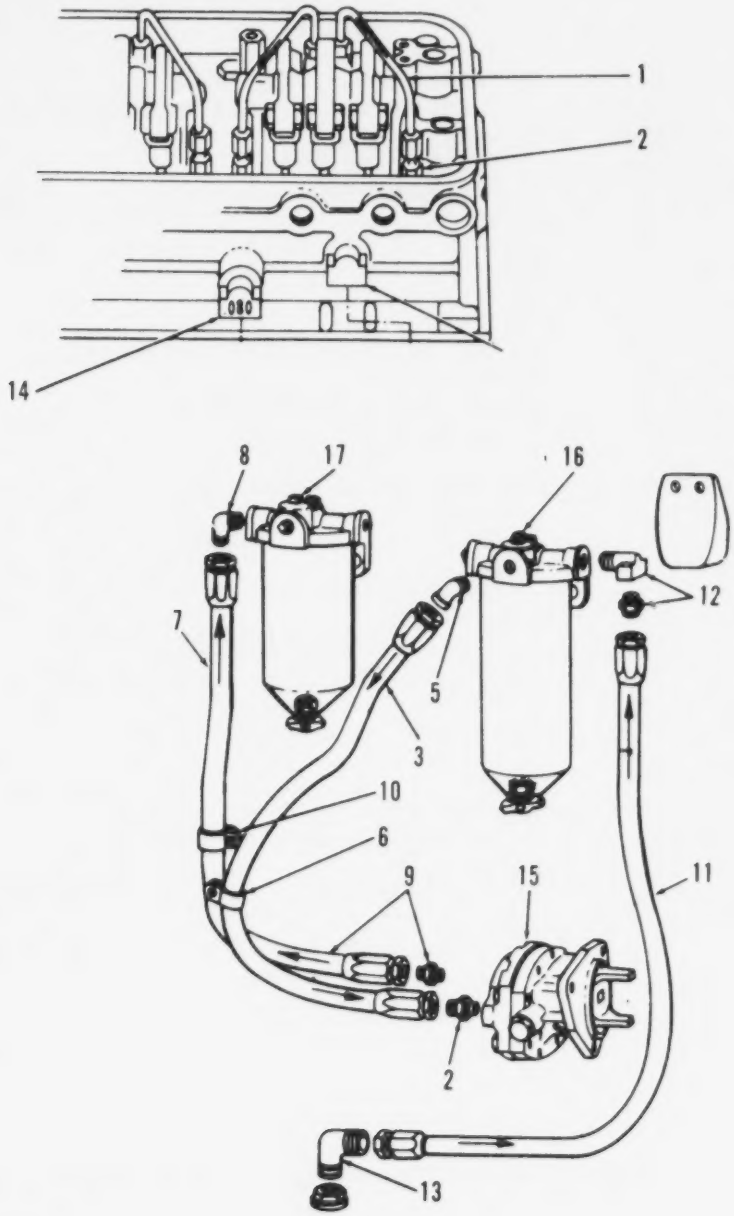


FIG. 22 - TYPICAL FUEL SYSTEM (IN-LINE MODELS)

2.4000 FUEL MANIFOLD CONNECTIONS

FIG/INDEX	PART NO.	NAME	QTY
22- 1	5116204	PIPE ASSY (INLET & OUTLET) (QTY. IS TWO TIMES CYLINDER COUNT)	AR
22- 2	5152138	CONNECTOR (QUANTITY IS TWO TIMES CYLINDER COUNT)	AR
-	5152148	WASHER (QUANTITY IS TWO TIMES CYLINDER COUNT)	AR

2.5000A FUEL LINES

FIG/INDEX	PART NO.	NAME	QTY
22-	5122279	VALVE, 1/4''	AR
22- 3	5121149	TUBE ASSY. (DEV. L. 39.76'')	1
22- 4	442323	. CONNECTOR, 3/8'' INV. FL. TUBE	1
22- 5	143338	. ELBOW, 3/8'' INV. FL. TUBE 45 DEG.	1
22- 6	5177623	CLIP, 3/8'' TUBE	2
22-	5160388	CLIP, 3/8'' TUBE	1
22- 7	5134899	TUBE ASSY. (DEV. L. 36.90'')	1
22- 9	442323	. CONNECTOR, 3/8'' INV. FL. TUBE	1
22- 8	137423	. ELBOW, 3/8'' INV. FL. TUBE 90 DEG.	1
22- 10	5112241	CLAMP	6
-	110502	BOLT, #10-24X3/4''	3
-	120217	LOCKWASHER, #10 MED	3
-	110633	NUT, #10-24 HEX.	3
- 11	5129623	TUBE (DEV. L. 12.68'')	1
- 12	442323	CONNECTOR, 3/8'' INV. FL. TUBE	1
- 13	137423	ELBOW, 3/8'' INV. FL. TUBE 90 DEG.	2
22- 14	5116440	ELBOW, RESTRICTED	1
22- 15	5146341	PUMP ASSEMBLY (NOT SERVICED; COMPONENTS ARE AVAILABLE)	1
22- 16	5575568	STRAINER ASSEMBLY (6 INCH)	1
22- 17	5573449	FILTER ASSY (4 INCH)	1

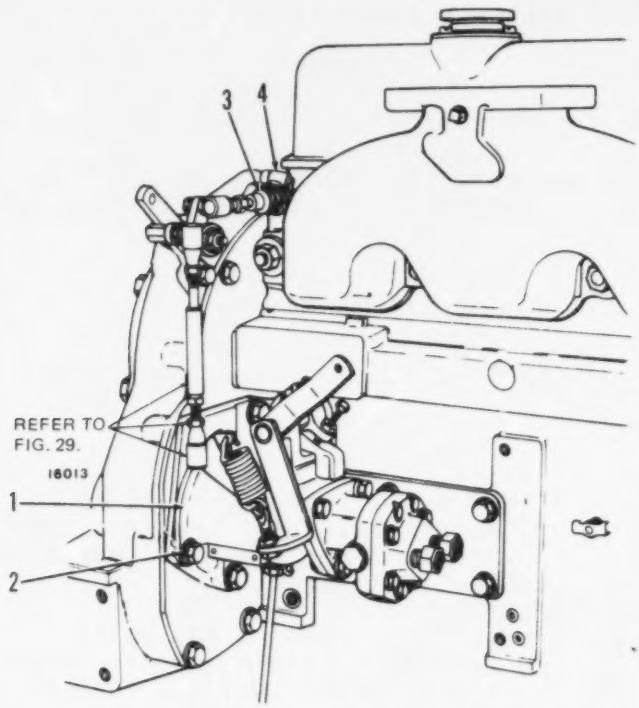


FIG. 23 - GOVERNOR (PIERCE)

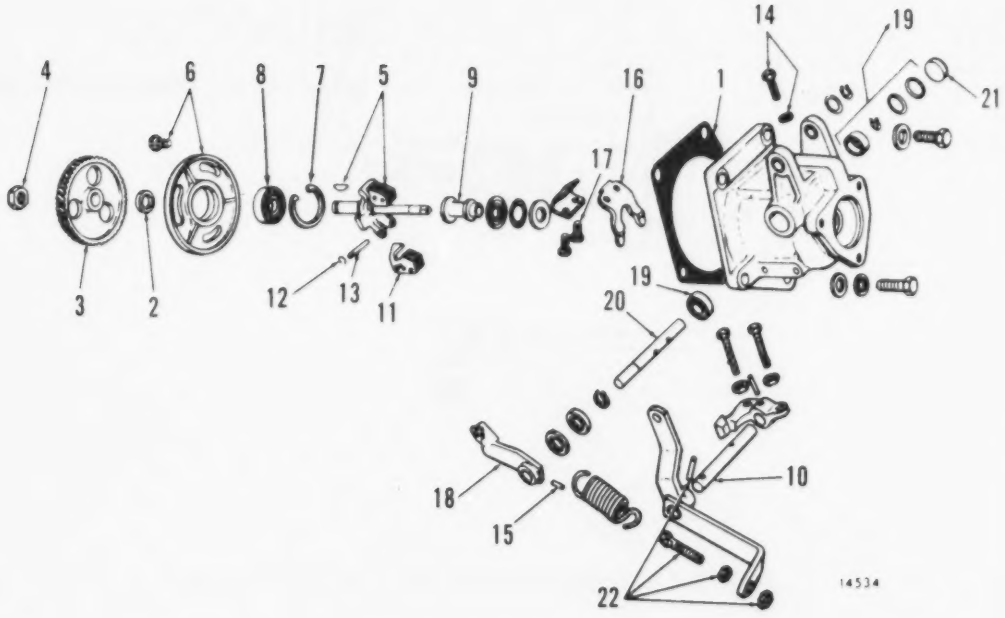


FIG. 24 - GOVERNOR

2.7000A MECHANICAL GOVERNOR

FIG/INDEX	PART NO.	NAME	QTY
23- 1	5138851	GOVERNOR ASSY.	1
23- 2	180083	BOLT, 5/16''-18X1 1/2''	2
23- 2	186679	BOLT, 3/8''-16X1 1/4''	2
23- 2	9414285	BOLT, 3/8''-24X7/8'' 12 PT. HD.	3
23- 2	5145225	WASHER, 3/8'' COPPER	3
23- 2	9414322	WASHER, 3/8'' FLAT	2
23- 2	103320	LOCKWASHER, 5/16''	2
-	5122166	NAME PLATE	1
-	145369	SCREW, #4X3/16	2
24-	5196856	. SHAFT ASSY.-REQ. FORCED LUB. OF GOV. WGT. HSG.; INCLUDES CARRIER	1
24-	5122756	HSG. (NOT SVCD. USE NO. 5144090 & INCL. (1) 444687 PLUG)	1
24- 1	5116336	GASKET	1
24- 2	5122738	SPACER (BETWEEN GEAR AND BEARING)	1
24- 3	5116025	GEAR	1
-	5116026	GEAR	1
-	124546	KEY, 5/32''X5/8'' WOODRUFF	1
24- 4	9434177	NUT, 5/16''-18 LOCK	1
24- 4	5125043	SHAFT & CARRIER ASSY.	1
24- 6	5122783	. SUPPORT	1
24- 7	907045	. BEARING	1
24- 8	9411502	. RING, SNAP	1
24- 9	5109544	. RISER-REQ. FORCED LUB. OF GOV. WGT. HSG.	1
24- 11	5122773	. WEIGHT	2
24- 12	5125044	. PIN	2
24- 13	9411504	RING, SNAP	4
24- 14	5177083	SCREW ASSY.	1
24- 15	5122746	PIN	1
24- 16	5122741	FORK	1
24- 17	9425382	SCREW & LOCKWASHER ASSY., #10-32X5/8''	2
24- 18	5122749	LEVER ASSY.	1
24- 19	9431894	BEARING	1
24- 21	5116262	ADAPTOR, INJECTOR CONTROL LINK BOOT	1
26- 22	122236	NUT, 3/8''-24 HEX.	1
24-	5122751	SHAFT	1
25-	5126432	COVER ASSY.	1
25- 1	5126430	. COVER ASSY.	1
25- 2	456540	. PIN, 3/16''X5/8'' ROLL	2
25- 3	5126309	. SHAFT ASSY. (ALSO INCLUDES (1) 113500 PIN)	1
25- 4	455734	. . PIN, 1/8''X3/4'' SPRING	1
25- 5	5179232	. SEAL RING	1
25- 6	5150238	. WASHER	1
25- 7	5122732	. RING, SNAP	1
25- 8	5101768	RETAINER	1
25- 9	9417926	SCREW, 1/4''-20X3/4'' FIL. HD. (WITH LOCKWASHER)	3
25- 9	453007	SCREW, 1/4''-20X1''	1
25- 10	5122742	GASKET	1
25- 11	5126312	LEVER	1
25- 12	213546	BOLT, 1/4''-20X1''	1
25- 13	103319	LOCKWASHER, 1/4''	1

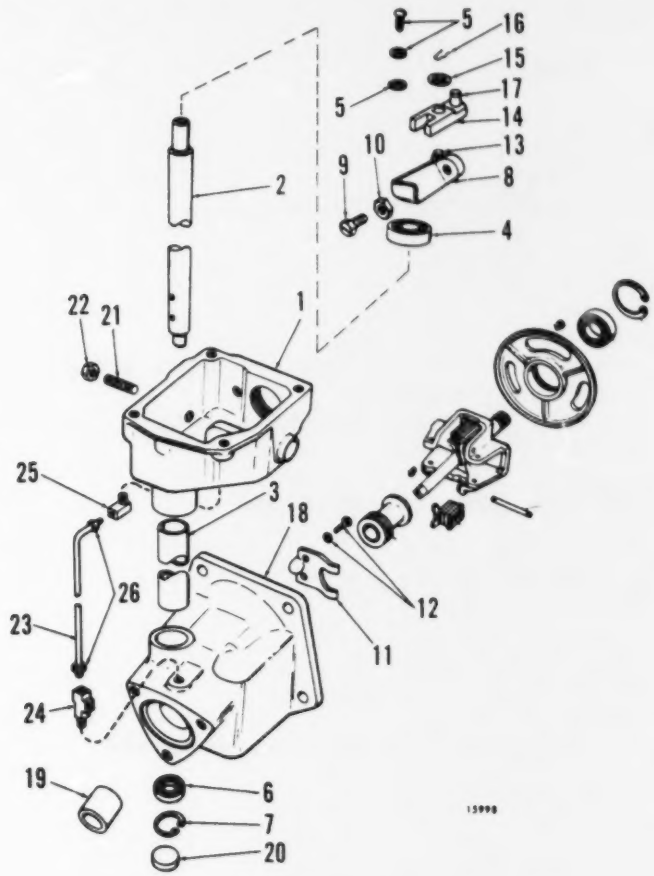


FIG. 26 - MECHANICAL GOVERNOR HOUSING WEIGHTS AND LEVER (3, 4 CYLINDER ENGINE)

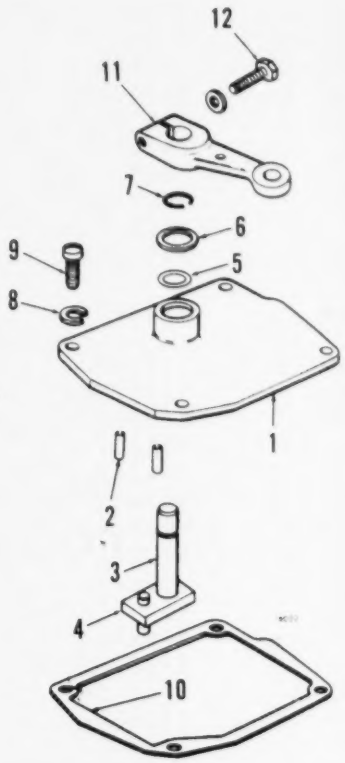


FIG. 25 - MECHANICAL GOVERNOR COVER (SINGLE LEVER)

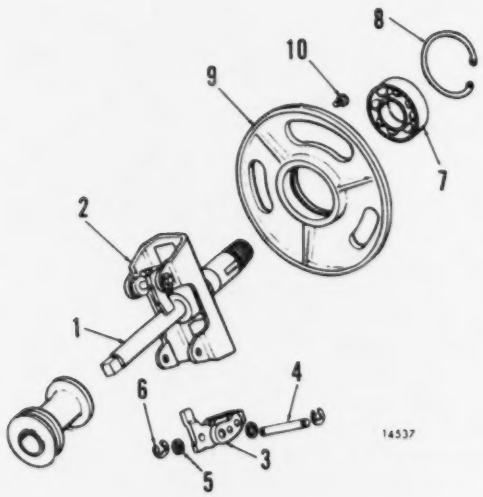


FIG. 27 - GOVERNOR WEIGHT SHAFT AND CARRIER

2.7000A MECHANICAL GOVERNOR

FIG/INDEX	PART NO.	NAME	QTY
-	5122752	SHAFT ASSY. (INCLUDES ITEMS 5122751, 9431894, & 9124917)	1
26- 3	5122754	TUBE	1
26- 5	9421917	SCREW & LOCKWASHER ASSY. #10-24X7/16''	1
26- 6	9431887	BEARING	1
26- 7	9413284	RING, SNAP (TO HOUSING)	1
26- 9	5150898	SCREW	1
26- 10	114492	NUT, 1/4''-28 HEX.	1
26- 14	5122743	LEVER ASSY. (INCLUDES PIN 5122745)	1
26- 15	5150941	WASHER	1
-	120391	WASHER, 7/32''X1/2''	1
26- 16	142583	RETAINER, 13/64'' SPRING	1
26- 17	5122745	PIN	1
26- 18	5129730	HOUSING	1
26- 19	5119127	BUSHING (WEIGHT SHAFT END)	1
26- 20	9428477	PLUG, CUP (15/16'' DIA.)	1
26- 23	5129726	TUBE ASSY.	1
26- 24	5143990	TEE,1/4''-1/4'' TUBEX1/8''PIPE,PART OF GOVERNOR ASSY.USED TO LUBRICATE UPPER CONTROL HOUSING	1
26- 25	5166265	ELBOW,1/4'' TUBEX1/8'' PIPE,90 DEG.PART OF GOVERNOR ASSY. LUBRICATES UPPER CONTROL HOUSING	1
-	5145009	PLUG, 1/4'' PIPE	1
26- 26	137405	CONNECTOR, 1/4'' TUBE X 1/8'' PIPE	1
-	5146132	SPRING	1
27- 5	5125339	. SPACER	4
27- 10	110529	SCREW, #10-24X1/4''	1
-	5127654	HSG. ASSY. NOT SVCD., FOR COMPLETE REPLACEMENT USE ASSY 5139262	1
28- 1	5126060	. HSG. NOT SVCD. USE 5145444 HSG. & INCLUDE (1)5145446 COVER, (1)5145445 GASKET AND (1)271468 SCREW AND LOCKWASHER ASSY.	1
28- 2	444692	. PLUG, 1/4'' PIPE	1
28- 3	5126789	. PLUG, 5/8'' CUP	1
-	5143564	. BOLT, 1/4''-20X1 1/2'' HEX. SKT. HD.	1
-	123390	. NUT, 1/4''-20 HEX.	1
28- 4	148402	. BEARING	2
28- 5	5173964	. SHAFT	1
28- 6	103904	. KEY, 3/32''X1/2'' WOODRUFF	1
28- 7	5176629	. LEVER NOT SVCD.USE(1)5139469 LEVER ASSY.& INCLUDE(1)5139468 BEARING AND (1) 9425165 PIN.	1
28- 8	223065	. SCREW, 5/16''-24X1/4'' SET	1
28- 9	5143665	. WASHER	1
28- 10	5176557	. SEAL RING	1
28- 11	186270	BOLT, 5/16''-18X3 1/2''	2
28- 12	103320	LOCKWASHER, 5/16''	2
28- 13	5152944	GASKET	1
28- 14	5127397	SPRING	1
28- 15	5162661	PLUNGER	1
28- 16	5130093	GUIDE	1
28- 17	5130094	BUSHING (PLASTIC)	1
28- 18	5137276	RETAINER	1
28- 19	5171784	STOP	1

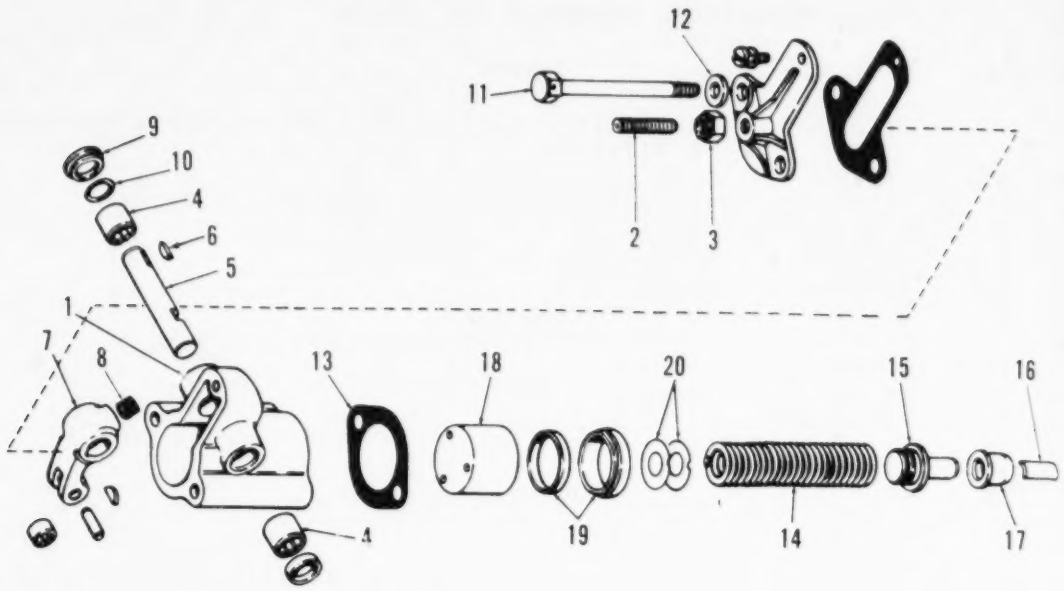


FIG. 28 - VARIABLE SPEED GOVERNOR SPRING AND HOUSING

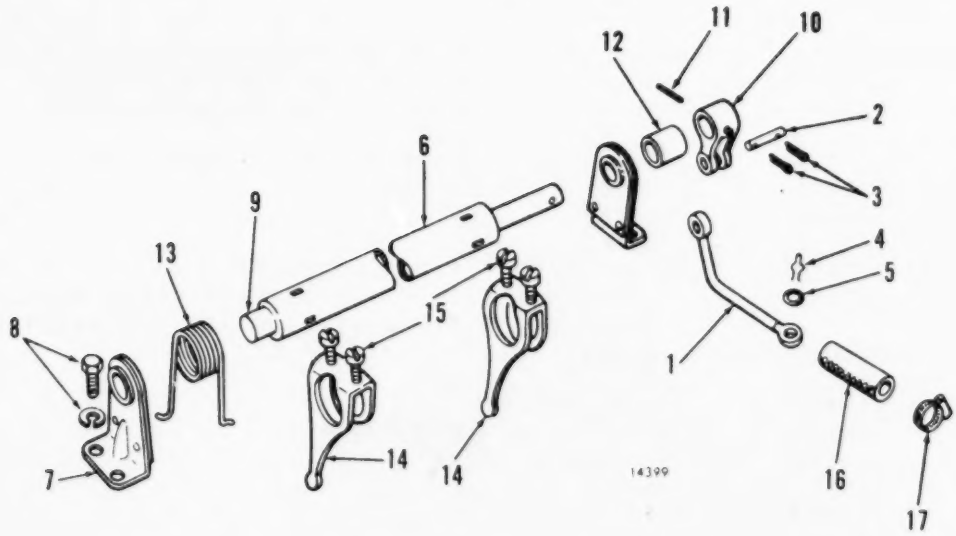


FIG. 29 - INJECTOR CONTROL TUBE

2.7000A MECHANICAL GOVERNOR

FIG/INDEX	PART NO.	NAME	QTY
28- 19	5174430	STOP	1
28- 20	5136590	SHIM (.010'')	AR
28- 20	5136591	SHIM (.078'')	AR
-	5144093	TUBE ASSY. (TEE TO CONTROL HOUSING)	1
29- 1	5122797	LINK	1
29- 2	5147345	PIN	1
29- 3	103361	PIN, 1/16X1/2'' COTTER	1
29- 4	142583	RETAINER, SRPING 13/64''	1
29- 5	5150941	WASHER	1
-	5116262	ADAPTOR	1
29- 16	5129707	HOSE	1
29- 17	272855	CLAMP, HOSE (SPRING 1 1/4")	2

2.9000 INJECTOR CONTROLS

FIG/INDEX	PART NO.	NAME	QTY
29- 6	5195968	TUBE ASSY.	1
29- 7	5116264	BRACKET	2
29- 8	9422203	BOLT, 1/4''-20X5/8''(12 PT.HD.)	4
29- 9	5150259	SHAFT(1 1/16'' L.)	1
29- 10	5116267	LEVER	1
29- 11	142486	PIN, 1/8''X3/4''GROOVE	1
29- 12	5116266	SPACER	1
29- 13	5116265	SPRING	1
29- 14	5115322	LEVER	3
29- 15	5176228	SCREW	6
-	2090519	ARM	1
-	213546	BOLT,1/4''-20X1''	2
-	120380	LOCKWASHER,1/4''	2
-	5146554	PLATE	1
-	5129913	SCREW	1
-	114493	NUT,5/16''-24 HEX.LOCK	1

FIG. 30 - THROTTLE CONTROL (PIERCE GOVERNOR)

2.9000A THROTTLE CONTROLS

FIG/INDEX	PART NO.	NAME	QTY
30- 1	5123878	BRACKET	1
30- 2	186628	BOLT,3/8''-16X1 1/2''	1
30- 2	103321	LOCKWASHER,3/8''(12.9200)	1
30- 3	5143344	SPRING	1
30- 4	5123762	EYE,1/4''-20X4''	1
30- 5	123179	NUT,1/4''-20 HcX.(12.9120)	2
30- 6	5186749	NUT,5/8''L.	1
30- 6	5171045	BOLT,5/16''-2	1
-	5123880	LEVER	1
-	180021	BOLT,1/4''-20X7/8''	1
-	120380	LOCKWASHER, 1/4''	1
30- 7	5146238	WIRE ASSY.(57'' L.)WIRE ASSY.LENGTH DETERMINED BY INSTAL'N.	1
-	5184255	PLATE,NAME	1
-	110730	LOCKWASHER,3/8''	1
-	122236	NUT,3/8''-24HEX.	1
30- 8	5161464	PIN,SWIVEL	1
30- 8	5150941	WASHER	1
30- 8	142583	RETAINER, 13/64'' SPRING	1
30- 8	132105	SCREW,#10-32X3/8''FIL.HD.	1
30- 9	5155782	CLIP	1
30- 9	3290569	CLIP	1
30- 10	123298	BOLT,1/4''-28X3/8''	1
30- 10	120380	LOCKWASHER,1/4''	1
30- 10	121902	NUT, 1/4''-28 HEX.	1
30- 11	5122797	LINK	1
30- 12	5123878	BRACKET	1

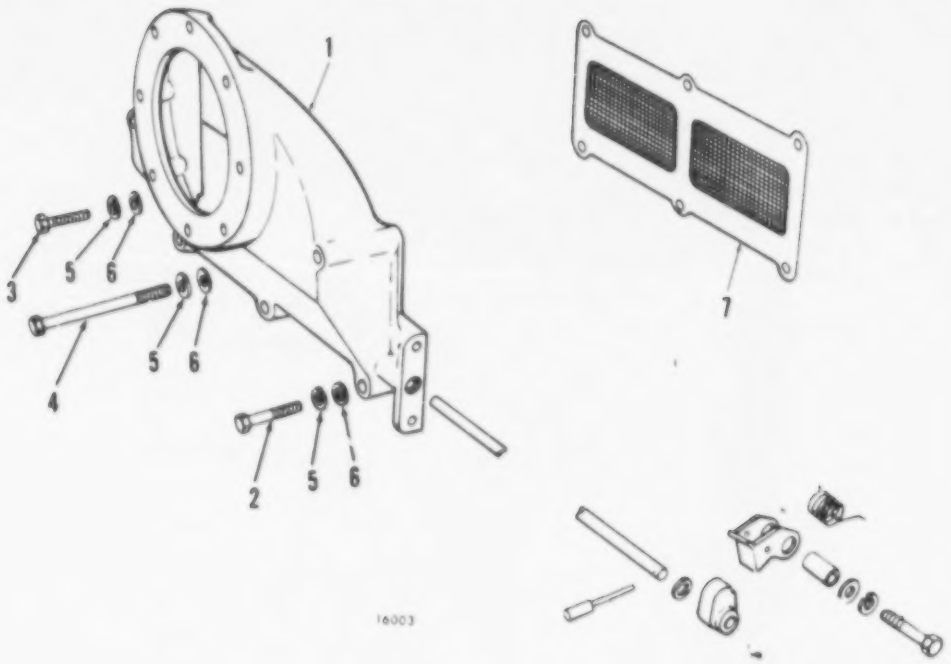


FIG. 31 - AIR INLET HOUSING

3.3000A AIR INLET HOUSING

FIG/INDEX	PART NO.	NAME	QTY
-	5121182	PLUG,1/4'' PIPE	1
31- 2	5157244	BOLT, 3/8''-16X1 3/4''	4
31- 3	179846	BOLT,3/8''-16X1 7/8''	1
31- 4	179851	BOLT,3/8''-16X3''	1
31- 5	103321	LOCKWASHER,3/8''	6
31- 6	103341	WASHER,3/8''	6
31- 1	5104449	HOUSING	1
-	5124405	GASKET	1

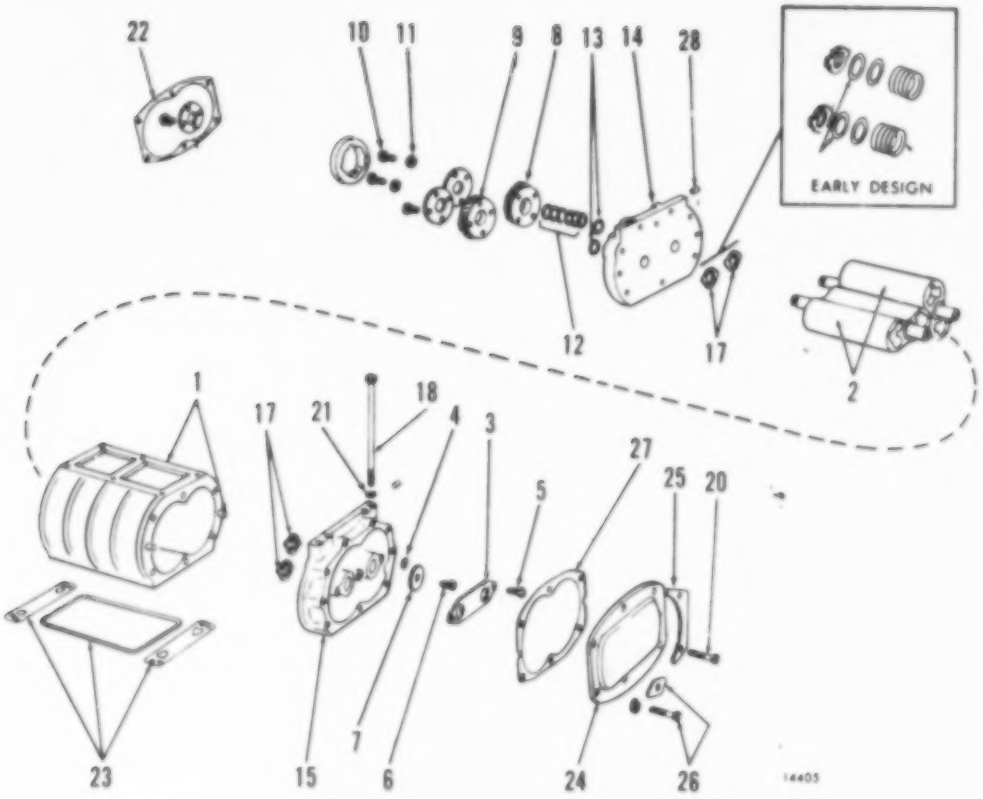


FIG. 32 - BLOWER ASSEMBLY (6V)

3.4000 BLOWER

FIG/INDEX	PART NO.	NAME	QTY
32-	5139305	BLOWER ASM.,	1
32- 1	5119391	. HOUSING(INCLUDES PINS)	1
32- 1	141242	PIN, 3/8''X7/8'' DOWEL	4
32- 2	5139297	. ROTOR ASSY.	2
32- 3	5134179	. PLATE	1
32- 4	5116170	. SPACER	3
32- 5	9409062	. BOLT, 1/4''-20X1''	3
32- 6	5127077	. WASHER,25/64I.D.	2
32- 7	9409034	. BOLT,3/8''-24X7/8''	2
32- 8	5119194	. GEAR(R.H. HELIX)	1
32- 9	5119195	. GEAR(L.H. HELIX)	1
32- 10	9409018	. BOLT,5/16''-24X7/8''	2
32- 11	5121403	. WASHER, 21/64''X1''X3/16''	2
32- 12	5116164	. SHIM(.002'')	AR
32- 12	5116165	. SHIM(.003'')	AR
32- 12	5116166	. SHIM(.004'')	AR
32- 12	5116167	. SHIM(.005'')	AR
32- 13	5116168	. SPACER	2
32- 14	5134914	. PLATE, FRONT	1
32- 15	5139299	. PLATE, REAR	1
32- 28	5145009	. PLUG,1/8'' PIPE	2
32-	117297	. SCREW, 5/16''-18X1 3/4'' FIL.HD.	4
32- 17	5142266	. SEAL(LIP TYPE)	4
32- 18	9433110	BOLT,7/16-14X6 11/16''	4
32-	5121464	BOLT (10 3/16''L.)	2
32- 20	5116150	BOLT(10 11/16''L.)	4
32- 21	5131913	WASHER(7/16'')(FLAT)	4
32-	5198041	BLOWER INSTALLATION KIT	AR
32-	5198684	REPAIR KIT NOT SERVICED,USE 5198683 KIT	AR
32- 22	5119433	GASKET (TO END PLATE)	1
32- 23	5116295	GASKET (TO BLOCK)	1
31- 7	5196053	SCREEN	1
-	5145009	PLUG, 1/8'' PIPE	2
-	117297	SCREW,5/16-18X1 3/4FIL.HD.	4
32- 24	5119429	COVER	1
32- 25	5119394	PLATE, REINFORCEMENT (LARGE)	2
32- 26	5119395	PLATE, REINFORCEMENT(SMALL)	2
32- 27	5119433	GASKET	1

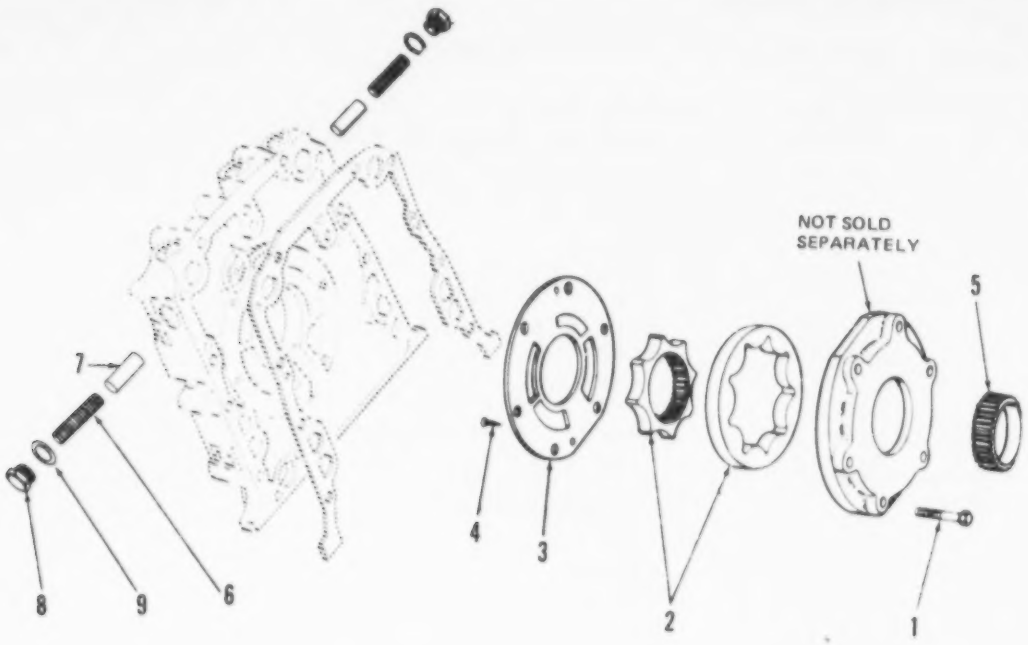


FIG. 34 - OIL PUMP AND PRESSURE REGULATOR

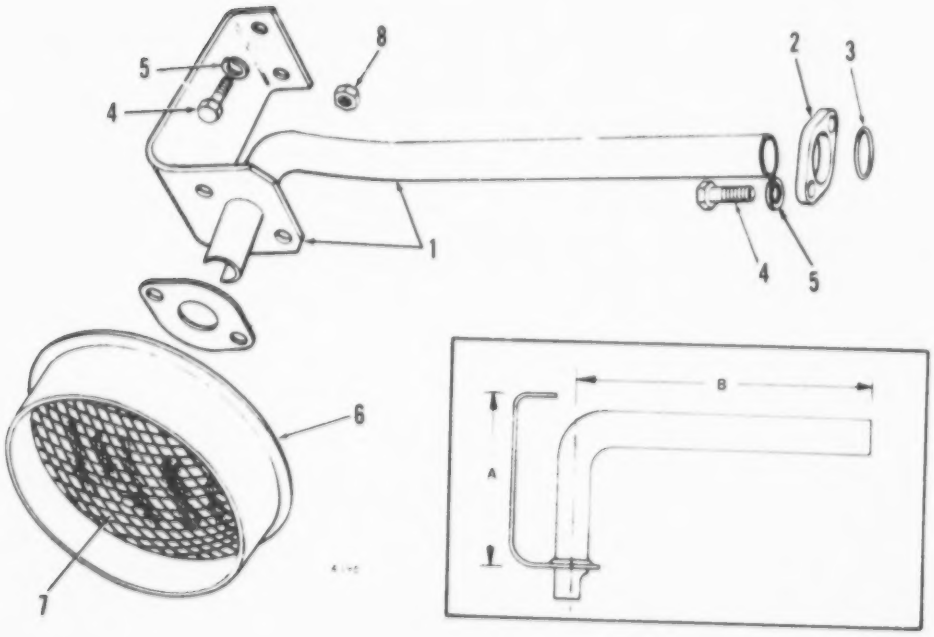


FIG. 35 - OIL DISTRIBUTION SYSTEM

4.1000A OIL PUMP

FIG/INDEX	PART NO.	NAME	QTY
34-	5116110	PUMP ASSY.	1
34- 1	193942	BOLT,5/16''-18X1 5/8''(AA LOCK)	6
34- 2	5195714	ROTOR SET (INCLUDES INNER AND OUTER ROTORS)	1
34- 3	5195685	COVER	1
34- 4	145067	SCREW, #6X3/8'' DRIVE	2
34- 5	5144375	GEAR	1
34- 6	5126436	SPRING, EFFECT.W/2D-13569,3D-4295,3D-6027, 6D-3858 FOR TYPE 12	2
34- 7	5177777	VALVE	2
34- 8	5113657	PLUG	2
34- 9	5177773	GASKET	2

4.1000B OIL DISTRIBUTION SYSTEM

FIG/INDEX	PART NO.	NAME	QTY
35- 1	5126211	PIPE,INCLUDES SUPPORT 5125947 NOT SERVICED SEPARATELY	1
35- 2	5119425	FLANGE	1
35- 3	5127175	SEAL RING	1
35- 4	179816	BOLT,5/16''-18X3/4''	4
35- 5	103320	LOCKWASHER, 5/16''	AR
35- 6	5126456	SCREEN ASSY.	1
35- 7	5152385	SCREEN	1
35- 8	274558	NUT,5/16''-24 HEX.LOCK	2

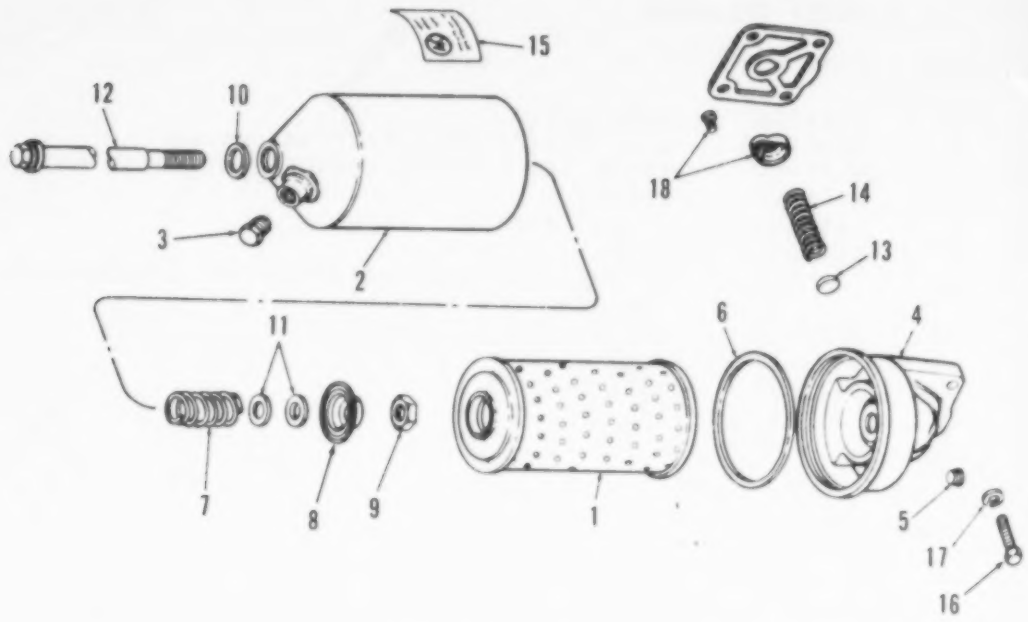


FIG. 36 - OIL FILTER

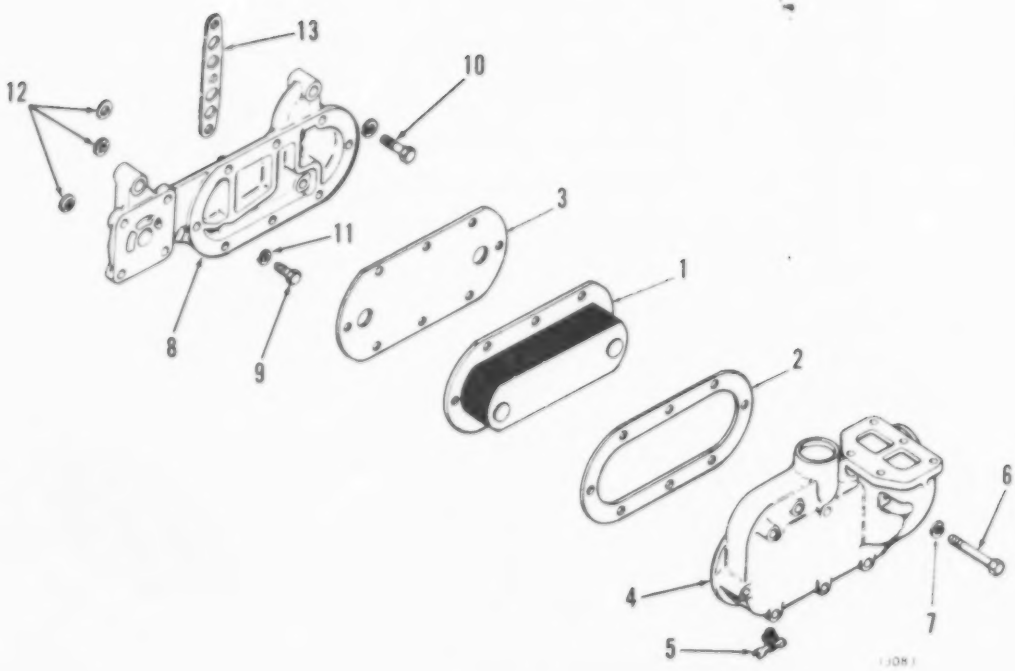


FIG. 37 - OIL COOLER

4.2000A OIL FILTER

FIG/INDEX	PART NO.	NAME	QTY
36-	5134393	FILTER ASSY. NOT SERVICED; FOR REPLACEMENT USE ASSEMBLY (5100 757).	1
-			
36- 1	5573014	. ELEMENT (9'')	1
36- 2	5574906	. SHELL (INCLUDES PLUG)	1
36- 3	5570480	. PLUG	1
36- 4	5123382	. ADAPTOR	1
36- 5	5121182	. PLUG, 1/4'' PIPE	1
36- 6	5571024	. GASKET	1
36- 7	5187308	. SPRING	1
36- 8	5187309	. RETAINER	1
-	5120602	. RETAINER(SNAP RING)	1
36- 9	122366	. NUT,5/8''-18HEX.	1
36- 10	5187310	. GASKET,RETAINER	1
36- 10	6437298	. GASKET	1
36- 11	5154538	. WASHER	1
36- 12	5120740	. STUD	1
-	5198303	. VALVE KIT	1
36- 13	5133431	. . VALVE	1
36- 14	5133594	. . SPRING	1
36- 18	5126686	. . PLUG	1
-	5575086	. GASKET	1
36- 15	5575213	DECAL	1
- 16	454906	BOLT,3/8''-16X1 1/2''	1
-	103341	WASHER, 3/8'' FLAT	4
- 17	103321	LOCKWASHER, 3/8''	4
-	5121205	GASKET	4
			1

4.4000A OIL COOLER

FIG/INDEX	PART NO.	NAME	QTY
37- 1	8501328	CORE ASSY. (6 PLATE)	1
37- 2	5150155	GASKET	1
37- 3	5102506	GASKET	1
37- 4	5119451	HOUSING	1
37- 5	103647	DRAINCOCK, 1/4''	1
37- 6	179830	BOLT, 5/16''-18X3''	1
-	186270	BOLT, 5/16''-18X3 1/2''	7
37- 7	103320	LOCKWASHER, 5/16''	1
37- 8	5123413	ADAPTOR	8
37- 9	186622	BOLT,3/8''-16X1 1/4''	1
37- 10	179847	BOLT, 3/8''-16X2''	4
37- 11	103321	LOCKWASHER, 3/8''	2
37- 12	5175882	GASKET (RING)	AR
37- 13	5119286	GASKET (STRIP)	3
			1

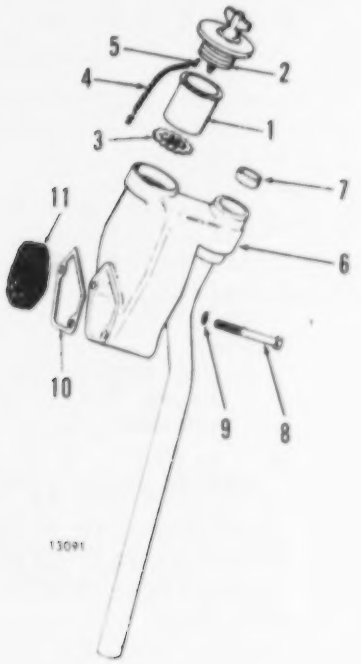


FIG. 38 - BREATHER AND OIL FILLER

4.5000A OIL FILLER

FIG/INDEX	PART NO.	NAME	QTY
38- 1	5121051	TUBE	1
38- 2	5120098	CAP ASSY.,(EXPANSION,1.75'' DIA.)	1
38- 3	5121058	STRAINER	1
38- 4	5113825	CHAIN	1
38- 5	5146248	HOOK,FILLER CAP	2

4.8000A VENTILATING SYSTEM

FIG/INDEX	PART NO.	NAME	QTY
38- 6	5121056	PIPE (ALSO FIG 5 ITEM 5)	1
38- 7	5150829	PLUG, 7/8'' CUP	1
38- 8	179828	BOLT, 5/16''-18X2 1/2''	2
38- 9	103320	LOCKWASHER, 5/16''	2
38- 10	5116391	GASKET	1
38- 11	5104007	ELEMENT	1

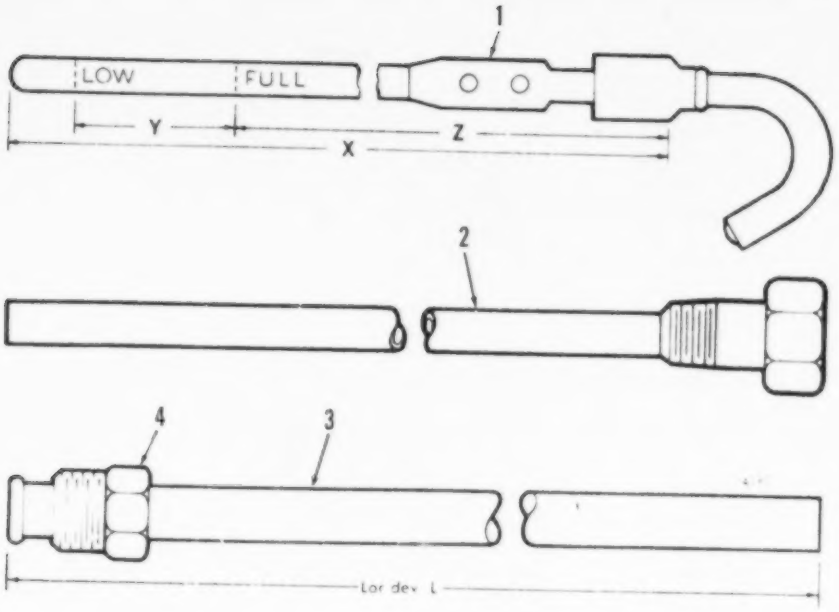


FIG. 39 - DIPSTICK

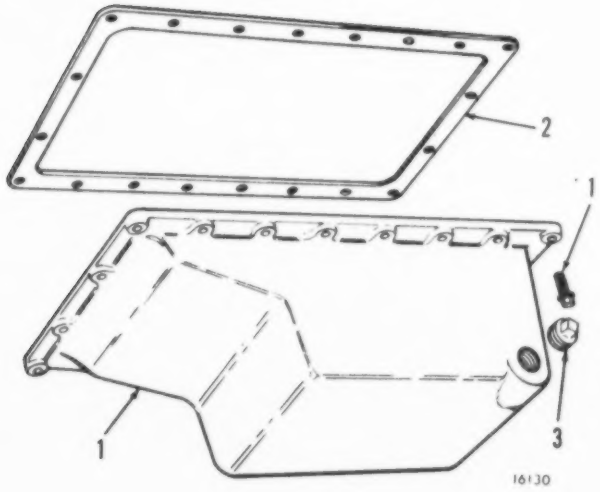


FIG. 40 - OIL PAN (CAST)

4.6000A DIPSTICK

FIG/INDEX	PART NO.	NAME	QTY
39- 1	5109253	DIPSTICK (X-12'',Y-.94'',Z-10.54'') NOT SVCD.USE 5146680	1
39- 2	5121062	GUIDE(1 1/8''L.)	1
39- 3	5109621	ADAPTOR(8.50''L.) (ALSO FIG 5 ITEM 6)	1
39- 4	137401	NUT, 1/2 INV. FL. TUBE	1

4.7000A OIL PAN

FIG/INDEX	PART NO.	NAME	QTY
40- 1	5146360	PAN	1
40- 1	5148437	BOLT, 5/16''-18X1''	20
40- 2	5116256	GASKET	1
40- 2	5115214	PLUG, 1/2''-14 HEX. SKT.	3
40- 3	5142549	PLUG, 3/4'' PIPE SQ. SKT.	1

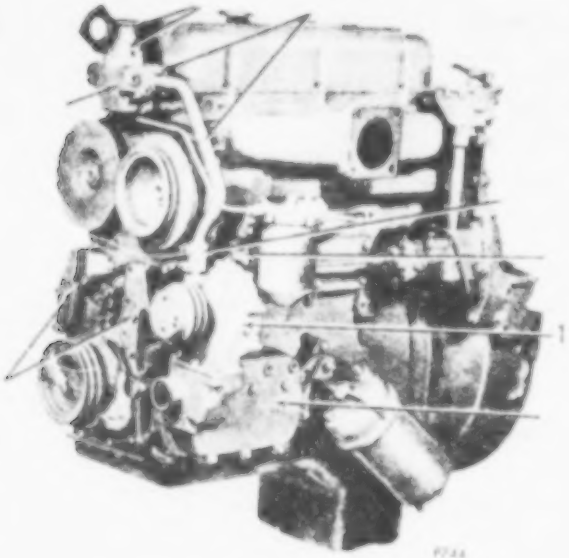


FIG. 42 - TYPICAL COOLING SYSTEM (IN-LINE ENGINE)

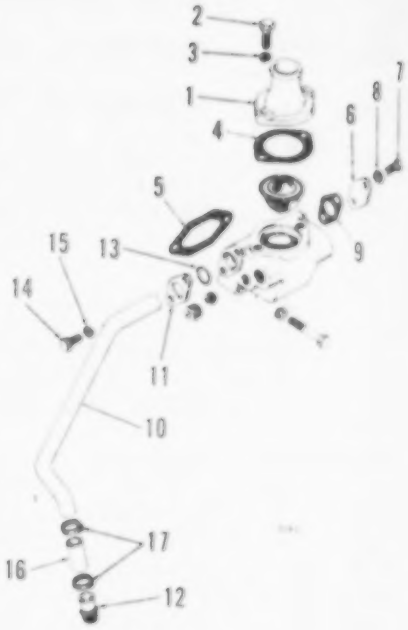


FIG. 44 - THERMOSTAT

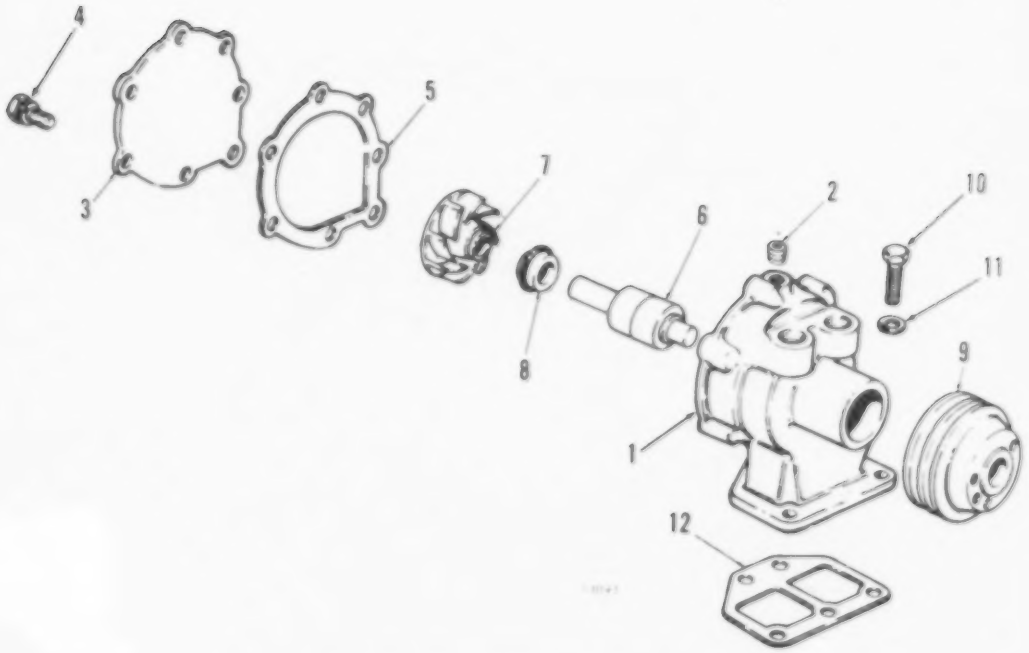


FIG. 43 - FRESH WATER PUMP

5.1000 FRESH WATER PUMP

FIG/INDEX	PART NO.	NAME	QTY
42- 1	5144685	PUMP ASSY. (ALSO FIG 5 ITEM 4)	1
43- 1	5144688	. BODY	1
43- 2	5145009	. PLUG, 1/8'' PIPE	1
43- 3	5119283	. COVER	1
43- 4	5148436	. BOLT, 5/16''-18X3/4''	7
43- 5	5119282	. GASKET	1
43- 6	904827	. SHAFT ASSY.	1
43- 7	5113800	. IMPELLER	1
43- 8	5130959	. SEAL	1
43- 9	5144503	. PULLEY	1
43- 10	186625	BOLT, 5/16''-18X7/8''	5
43- 11	103320	LOCKWASHER, 5/16''	AR
43- 12	5133107	GASKET	1
-	5197279	REPLACEMENT KIT, IMPELLER INSERT	AR

5.2000A WATER OUTLET MANIFOLD AND/OR ELBOW

FIG/INDEX	PART NO.	NAME	QTY
44- 1	5116409	FLANGE, (2 1/2''L.)	1
44- 2	186619	BOLT, 3/8''-16X1 1/8''	2
44- 3	103321	LOCKWASHER, 3/8''	2
44- 4	5116092	GASKET	1

5.2000C WATER BY-PASS TUBE

FIG/INDEX	PART NO.	NAME	QTY
44- 10	5108944	TUBE	1
44- 11	5119425	FLANGE	1
44- 12	5144702	CONNECTOR	1
44- 13	5184301	SEAL RING	1
-	5142549	PLUG, 3/4'' PIPE	1
44- 14	186625	BOLT, 5/16''-18X7/8''	2
44- 15	103320	LOCKWASHER, 5/16''	AR
44- 16	5169721	HOSE, 7/8''I.D.X1.74''L.STD.LENGTH HOSE;CUT TO LENGTH SHOWN	1
44- 17	5186840	CLAMP, 1'' DIA. HOSE	2

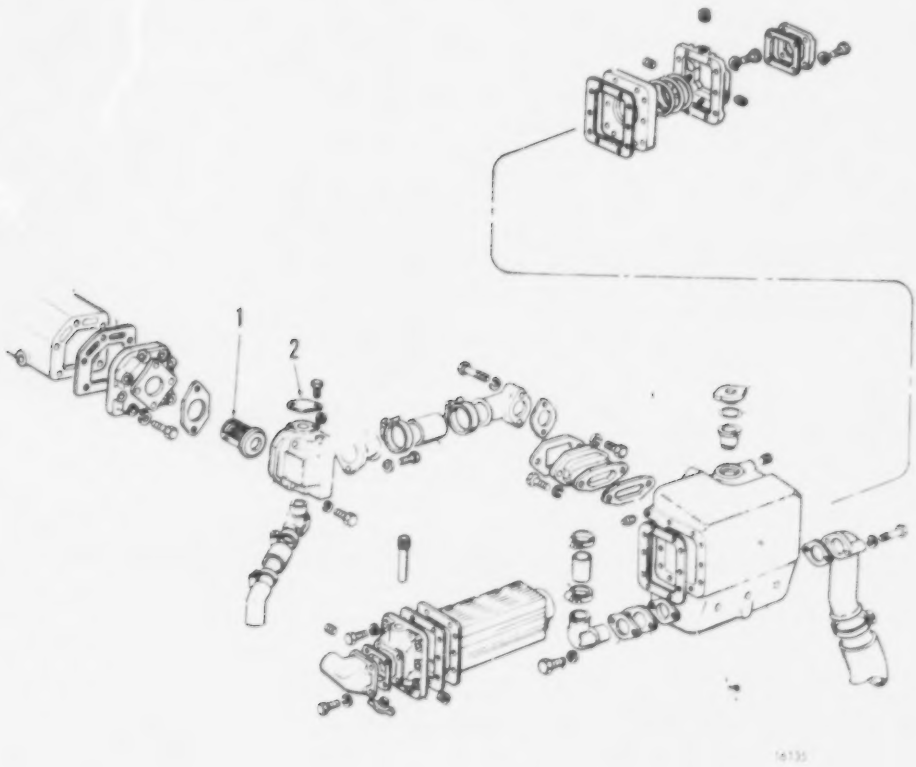


FIG. 45 - HEAT EXCHANGER (IN-LINE MODELS)

5.20000B THERMOSTAT

FIG/INDEX	PART NO.	NAME	QTY
45- 1	3041379	THERMOSTAT ASSY.	1
45- 2	5123247	HOUSING	1
-	5145014	PLUG, 3/8'' PIPE	2
-	5115214	PLUG, 1/2'' PIPE	2
-	108608	BOLT, 3/8''-16X2 1/8''	2
-	103321	LOCKWASHER, 3/8''	AR
44- 5	5116242	GASKET	1
44- 6	5119426	FLANGE	1
44- 7	186618	BOLT, 5/16''-18X5/8''	2
44- 8	103320	LOCKWASHER, 5/16''	AR
44- 9	5128139	GASKET	1

5.30000B WATER CONNECTIONS

FIG/INDEX	PART NO.	NAME	QTY
-	5119026	ELBOW, NOT SERVICED,USE 5138275 PLUS (2)5145014.	1
-	179819	BOLT, 5/16''-18X1 1/8''	2
-	103320	LOCKWASHER, 5/16''	2
-	5116357	GASKET	1
-	5199777	HOSE(17/8''I.D.X4 3/4'')STD.LNGTH.HOSE, CUT TO LNGTH. SHOWN	1
-	5186841	CLAMP, 1 9/16''-2 1/2'' DIA. HOSE	2

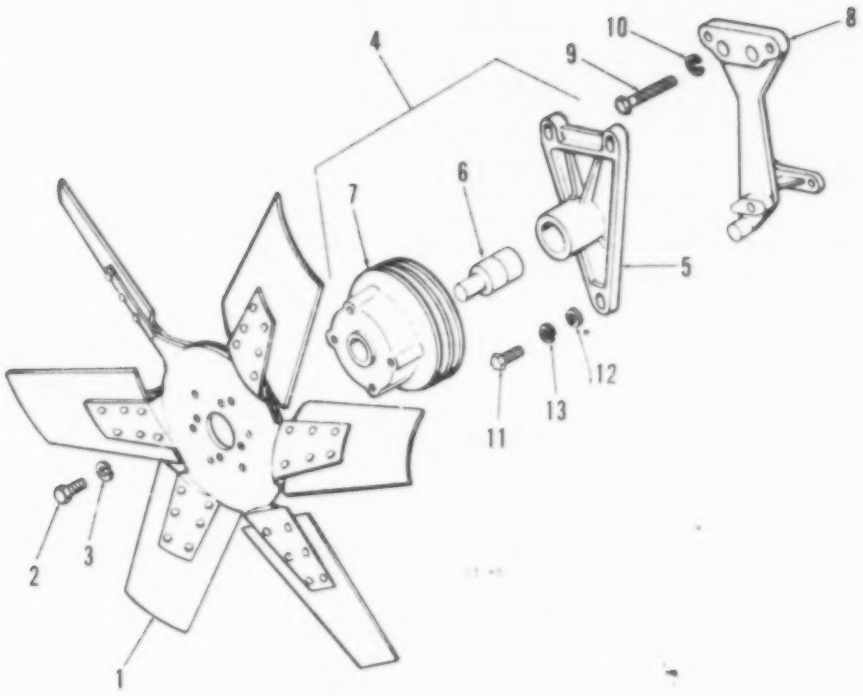


FIG. 46 - FAN SHAFT & PULLEY

5.4000A FAN

FIG/INDEX	PART NO.	NAME	QTY
46- 1	5145773	BLADE, 18-6 BLADE, SUCTION	1
46- 2	186625	BOLT, 5/16''-18X7/8''	4
46- 3	103320	LOCKWASHER, 5/16''	4
46- 4	5122868	PULLEY ASSY.	1
46- 5	5116477	. BRACKET	1
46- 6	905619	. SHAFT ASSY	1
46- 7	5148420	. PULLEY (4.30'' DIA.)	1
46- 8	5126868	SUPPORT	1
46- 9	186619	BOLT, 3/8''-16X1 1/8''	2
46- 9	186282	BOLT, 3/8''-16X3 1/4''	2
46- 10	103321	LOCKWASHER, 3/8''	4
46- 11	186612	BOLT, 3/8''-16X1 3/8''	3
46- 12	103341	WASHER, 3/8'' FLAT	AR
46- 13	103321	LOCKWASHER, 3/8''	AR

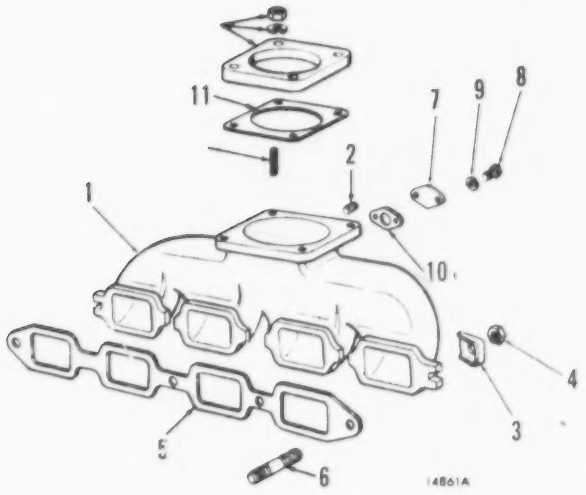


FIG. 47 - EXHAUST MANIFOLD (CENTER OUTLET)

6.1000A EXHAUST MANIFOLD

FIG/INDEX	PART NO.	NAME	QTY
47- 1	5146215	MANIFOLD	1
47- 2	113175	PLUG, 1/8'' PIPE	2
47- 3	5104439	WASHER (DISHED, 1 1/4'' O.D.)	4
47- 4	127855	NUT, 7/16''-20	4
47- 5	5116205	GASKET	1
47- 6	5112899	STUD, 7/16''X2 3/32''L.	4
47- 7	5121098	PLATE	2
47- 8	186618	BOLT, 5/16''-18X5/8''	4
47- 9	103320	LOCKWASHER, 5/16''	4
47- 10	5113412	GASKET	2

6.2000A EXHAUST MUFFLER AND/OR CONNECTIONS

FIG/INDEX	PART NO.	NAME	QTY
-	NPN	FLANGE(CUSTOMER FURNISHED)	1
47- 11	5108377	GASKET	1

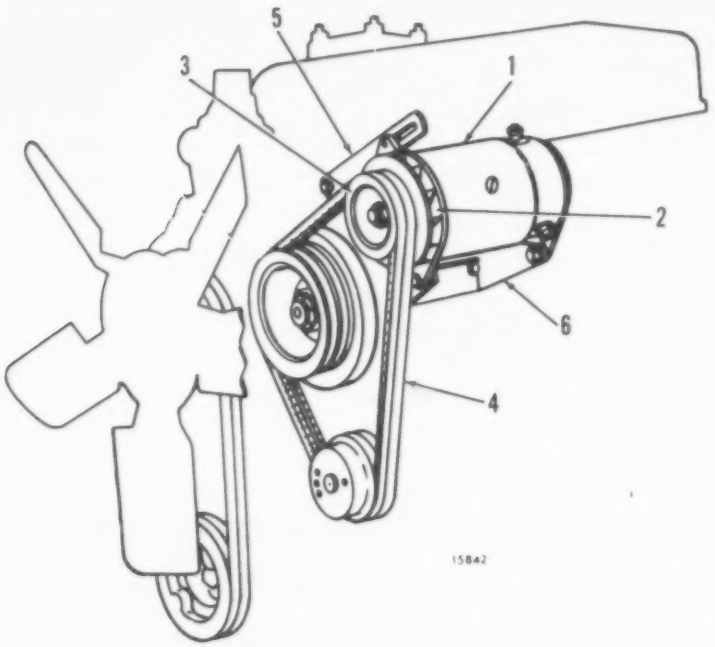


FIG. 48

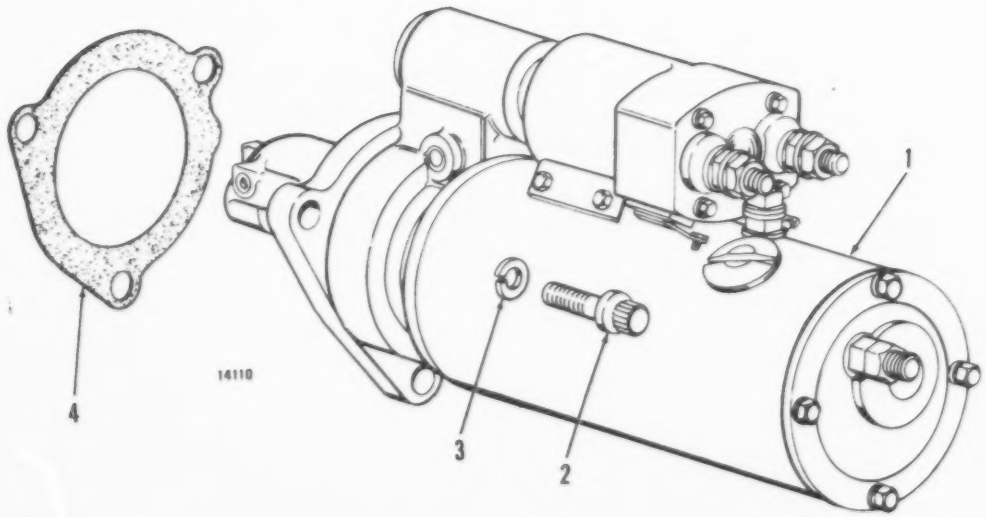


FIG. 49 - STARTING MOTOR

7.1000A BATTERY CHARGING GENERATOR

FIG/INDEX	PART NO.	NAME	QTY
48- 1	1102920	ALTERNATOR(12V.,42AMP.,C.W./C.C.W. NEGATIVE GROUND)	1
-	186285	BOLT, 3/8''-16X4''	1
-	5131433	WASHER, SPECIAL	2
-	103321	LOCKWASHER, 3/8''	AR
-	102635	NUT, 3/8''-16	1
48- 2	1970765	FAN	1
48- 3	5132527	PULLEY	1
48- 4	5133173	BELT SET (2 BELTS, 42''L.X.380''W.)	1
48- 5	5148773	STRAP NOT SERVICED, USE 5102731 STRAP AND 5102729 BRACKET	1
48- 5	5121403	SPACER, 3/16'' THICK	1
48- 5	186624	BOLT, 5/16''-18X1 1/4''	1
48- 5	179819	BOLT, 5/16''-18X1 1/8''	1
48- 5	186622	BOLT, 3/8''-16X1 1/4''	1
48- 5	103320	LOCKWASHER, 5/16''	AR
48- 5	103321	LOCKWASHER, 3/8''	AR
48- 6	5102005	BRACKET	1
48- 6	5137947	BUSHING	1
48- 6	186628	BOLT, 3/8''-16X1 1/2''	3
48- 6	179850	BOLT, 3/8-16X2 1/4	3
48- 6	5132147	WASHER,.40ID.X.20	3
48- 6	103321	LOCKWASHER, 3/8''	AR
-	5100420	WIRE ASSY.(INCLUDES RECTIFIER)	1
-	106498	LOCKWASHER,#12	1
-	103089	NUT, 12-24 HEX.	1

7.3000A STARTING MOTOR

FIG/INDEX	PART NO.	NAME	QTY
49- 1	1113216	MOTOR ASSY.,12V.,C.W.,GRD.SPRAG	1
49- 2	9418228	BOLT, 5/8''-11X1 3/4'',12PT.	1
49- 2	223435	BOLT, 5/8''-11X1 3/4''	2
49- 3	103325	LOCKWASHER, 5/8''	3
49- 4	5130995	GASKET	1

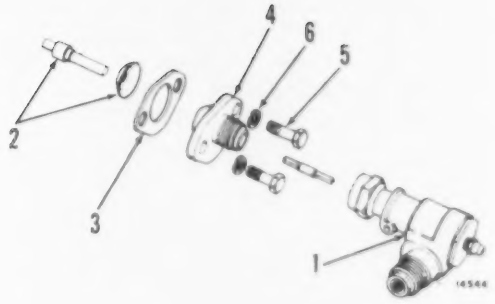


FIG. 50 - FRONT MOUNTED CAM DRIVE

7.4000B TACHOMETER DRIVE

FIG/INDEX	PART NO.	NAME	QTY
50- 1	5102049	ADAPTOR	1
50- 2	6454339	SHAFT(2.38''L.)	1
-	5123118	COVER ASSY.(INCLUDES STUDS)	1
-	5155854	. STUD(5/16''X1 3/32''L.)	2
-	179857	BOLT, 7/16''-14X7/8''	1
50- 3	5135935	GASKET	1
50- 4	5136249	ADAPTOR	1
50- 5	186647	BOLT, 1/4''-20X1''	1
50- 6	103320	LOCKWASHER, 5/16''	AR
-	114493	NUT, 5/16''-24 HEX.	2

SECTION IV

SUPPLEMENTAL

OPERATING, MAINTENANCE

AND

REPAIR PARTS

INSTRUCTIONS

best copy available

SUPPLEMENTAL OPERATING MAINTENANCE & REPAIR PARTS INSTRUCTIONS
FOR
Roller, Vibratory, Self-propelled, Rexnord Model SP-848

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SECTION I

GENERAL

1-1. Purpose. To provide User and Support personnel supplemental maintenance and repair parts instructions that have special application to Commercial Construction Equipment (CCE) items.

1-2. Scope. This publication applies to Department of the Army Units, Organizations and Activities that use and/or support the CCE Self-Propelled Vibratory Roller, Rexnord Model SP-848.

1-3. CCE Item. The term "CCE Item" used in this publication applies to a standard commercial item of commercial equipment that has been approved for a specific TOE requirements and is procured and supported under the CCE System Plan. This plan permits maximum utilization of the civilian construction industry's competitive research and development, manufacturer's equipment publications and commercial sources for repair parts.

1-4. Description. The CCE Vibratory Self-Propelled, High Impact, Single Smooth Drum Roller manufactured by Rexnord Inc. is powered by an in-line three cylinder Detroit Diesel Engine. This engine (3-53 series) is used in other construction equipment items currently in the Army System. Engine power is transmitted to the final drive by using a hydrostatic drive with a 2-speed transmission. The steering is articulated, full power hydraulic type.

1-5. Operational Concept. The CCE Self-Propelled Vibratory Roller is intended for use in contruction operations, i.e., road construction and repair, airfield and port construction. Primary tasks are compacting new road beds of soil, sand or gravel preparatory to laying of asphalt pavements. Secondary uses are compaction of pavement base courses and stabilized bases.

1-6. Procurement Status. The procurement contract number is DLA700-78-C-8327 and was awarded on 21 Sep 78 for a total of 64 units.

1-7. Equipment Publications.

a. Initially two sets of the manufacturer's commercial publications will be overpacked and shipped with each Roller (reference Appendix A).

b. The overpacked publications are located in the tool box built into the Roller frame.

1-8. Personnel and Training.

a. MOS Requirements:

(1) Operator: 62J, General Construction Equipment Operator.

(2) Organizational Maintenance: 62B, Engineer Equipment Repairman.

(3) Direct and General Support Maintenance: 62B, Engineer Equipment Repairman; 63G, Fuel and Electrical Systems Repairman, 44B, Metal Body Repairman.

b. New Equipment Training: New Equipment Training Teams (NETTs) are available to major field commands. Requests for NETTs should be forwarded to Commander, US Army Tank-Automotive Materiel Readiness Command (TARCOM), ATTN: DRSTA-MLT, Warren, MI 48090. Training teams should be requested only when trained personnel are not available in the command to operate and/or maintain the Roller.

1-9. Logistics Assistance.

a. Tank-Automotive Command Field Maintenance Technicians stationed at CONUS and OCONUS installations will be fully qualified and available to furnish on-site training and or assistance concurrent with receipt of the Roller.

b. Assistance can be obtained by contacting the Logistics Assistance Office listed in Appendix B of AR 700-4.

1-10. Warranty. The CCE Roller contractor warrants the products furnished under this contract according to the terms and conditions described in the equipment publications and Appendix B of this publication. All warranties furnished to the Roller contractor by subcontractors of assemblies or components utilized in the manufacture of the end item will be extended to the Government. See Appendix B for warranty guidelines.

1-11. Reporting. You can improve this publication by recommending improvements, using DA Form 2028 (Recommended Changes to Publications and Blank Forms) and mail direct to Commander, US Army Tank-Automotive Materiel Readiness Command, ATTN: DRSTA-MVB, Warren, MI 48090.

SECTION II

MAINTENANCE

2-1. Maintenance Concept. The CCE Roller will not require any new or special maintenance considerations. All maintenance functions can be accomplished within the current maintenance concepts established for construction equipment.

a. Operator/Crew Maintenance: Operator and crew maintenance is limited to daily preventive maintenance checks and services.

b. Organizational Maintenance: Organizational maintenance consists of scheduled preventive maintenance services, minor repairs and adjustments.

c. Direct Support Maintenance: Direct Support Maintenance consists of repairs on-site or in a direct support units shops. Repairs are accomplished with a minimum of tools and test equipment; the assemblies and end items thus repaired are returned to their users.

d. General Support Maintenance: General support maintenance overhauls selected assemblies and repairs items designated by the area support command for return to stock.

e. Depot Maintenance: Depot maintenance overhauls end items and selected major assemblies when they are required to satisfy overall Army requirements. Overhaul of the end item may also be performed by contract with the manufacturer.

2-2. Maintenance Allocation Chart. Maintenance will be performed as necessary by the category indicated in the Maintenance Allocation Chart (MAC) (Appendix C) to retain or restore serviceability. All authorized maintenance within the capability of a using organization will be accomplished before referring the item to support maintenance. Higher categories will perform the maintenance functions of lower categories when required or directed by the appropriate Commanders. Using and support units may exceed their authorized scope and functions in the MAC when approval is granted by the next higher support maintenance Commander.

2-3. Modifications. Modifications will be accomplished by the end item manufacturer after TARCOM approves the field campaign or modification plan. See Appendix D.

2-4. Equipment Improvement Recommendations (EIR). Equipment Improvement Recommendations will be submitted in accordance with TM 38-750.

2-5. Equipment Serviceability Criteria (ESC). Equipment Serviceability Criteria are not applicable to the Roller (AR 750-1).

2-6. Maintenance Expenditure Limits. The average life expectancy for the Roller is 15 years.

PERCENT OF REPAIR	YEAR
50%	1984
45%	1986
40%	1988
35%	1990
30%	1992
20%	1994
10%	1995

2-7. Shipment and Storage.

a. Shipment and Storage. Refer to TB 740-94-2 for precedures covering preservation of equipment for shipment and storage.

b. Administrative Storage. Refer to TM 740-90-1 for instructions covering administrative storage of equipment.

2-8. Destruction to Prevent Enemy Use. Refer to TM 750-244-3 for procedures covering destruction of equipment to prevent enemy use.

2-9. Fire Protection.

a. A hand operated fire extinguisher may be installed at the discretion of the using unit.

b. Approved hand-portable fire extinguishers are listed in TB 5-4200-200-10.

2-10. Basic Issue Items List (BIIL). See Appendix E for a list of items which accompany the end item or are required for operation and/or operator's maintenance.

2-11. Maintenance and Operating Supply List. See Appendix F for a list of maintenance and operating supplies required for initial operation.

2-12. Special Tools and Equipment. No special tools or equipment are required for operation and maintenance of the Roller.

2-13. Maintenance Forms and Records. Operational maintenance and historical records will be maintained as required by the current TM 38-750.

2-14. Roll Over Protection System (ROPS). ROPS is available for the Model SP-848 roller from Rexnord Inc. in a kit form. Commanders will refer to AR 385-55, paragraph 7-9. Additional safety devices, when modifications, are required.

2-15. Towing Instructions.

a. Before towing a unit that has malfunctioned, ensure that the Forward-Reverse and Vibration Levers are in the neutral positions and that the parking brake has been released.

b. Tow the unit only when necessary and at speeds of one to two miles per hour for as short a distance as possible.

2-16. Safety Precautions. Always observe the following safety precautions to prevent possible injury to personnel and damage to the equipment.

a. TRAINED OPERATORS ONLY.

b. Always use slower unit speeds and added caution when operating close to a lift edge or when traveling downhill.

c. Never travel across a slope. Always travel up or down a slope.

d. Always engage the parking brake before dismounting the unit.

e. Never shut down the engine when traveling up or down a slope. Always move the Forward-Reverse Lever toward neutral to apply hydrodynamic braking.

f. KEEP CLEAR OF HITCH AREA when unit is operational. Hitch area closes when unit is turned.

SECTION III

REPAIR PARTS SUPPLY

3-1. General.

a. The basic policies and procedures in AR 710-2 and AR 725-50 are generally applicable to repair parts management for CCE items.

b. Manufacturer's parts manuals are furnished with CCE items instead of Department of the Army Repair Parts and Special Tool List (RPSTL).

c. National Stock Numbers (NSN's) are initially assigned only to PLL/ASL parts and major assemblies, i.e., engines, transmissions, etc. Additional NSN's are assigned by the supply support activities as demands warrant.

d. Automated Processing (AUTODIN) of Federal Supply Code Manufacturer (FSCM) part number requisitions, without edit for matching NSN's and exception data, is authorized.

e. Proper use of project codes and weapons systems designator codes on parts requisitions is essential.

f. Repair parts are available from commercial sources and may be purchased locally in accordance with AR 710-2 and AR 734-110.

g. Initial Prescribed Load List (PLL) and Authorized Stock List (ASL) will be distributed by US Army Tank-Automotive Materiel Readiness Command (TARCOM), ATTN: DRSTA-FH.

3-2. Prescribed Load List (PLL). The PLL distributed by TARCOM is an estimated 15 days supply recommended for initial stockage at organizational maintenance. Management of PLL items will be governed by the provisions of AR 710-2 and local command procedures. Selection of PLL parts for shipment to CONUS/OCONUS units is based upon the receiving command's recommendation after their review of the TARCOM prepared list. Organizations and activities in CONUS/OCONUS will establish PLL stocks through normal requisitioning process.

3-3. Authorized Stockage List (ASL). The ASL distributed by TARCOM is an estimated 45 days supply of repair parts for support units and activities. The ASL parts will be shipped according to the recommendations of the receiving commands, after they have reviewed the initial list distributed by TARCOM. Support units and activities in CONUS/OCONUS will establish ASL stocks through normal requisitioning process.

3-4. Requisitioning Repair Parts.

a. Using Units/Organizations: Requisitions (DA Form 2765 Series) will be prepared according to AR 710-2 and local command directives. All requisitions will have the Weapons System Designator Code "87" (interim change 5-1, AR 710-2, per DA message, DALO-SMS, 091400Z June 1978) entered in the 2nd and 3rd positions of block 18. Units in CONUS will use Project Code "BGW" in block 19. Units OCONUS will enter in block 19 Project Code "JZC", see Appendix H.

b. Support Units and Activities:

(1) General: ALL MILSTRIP requisitions (DD Form 1348 Series) prepared for repair parts support of CCE items will include distribution and project codes, see Appendixes I, J and K.

(2) Distribution Code: Supply Customers in CONUS will use code "F" in card column 54. Customers OCONUS will use the appropriate code from Appendix P, paragraph P-3a(1), AR 725.50. Weapons System Designator Code "87" (DA Message DALO-SMS, 091400Z Jun 78) will be entered in card columns 55 and 56 of all requisitions.

(3) Project Codes: The applicable project code will be entered in card columns 57-59 of requisitions for non-NSN parts, whether CONUS or OCONUS customers. The Project Code "BGW" will be used by CONUS customers when requisitioning part numbered parts. Supply customers OCONUS will use Project Code "JZC" for part numbered parts.

3-5. Submitting Requisitions.

a. Using Units and Organizations will submit DA Form 2765 Series requisitions to designated support units or activities in accordance with local procedures.

b. Support units and activities will forward MILSTRIP requisitions for NSN parts through the Defense Automated Addressing System (DAAS) to the Managing Supply Support Activity. Requisitions for part numbered parts will be forwarded through DAAS to the Defense Construction Supply Center (DCSC).

NOTE: When the manufacturer's part number and Federal Supply Code for Manufacturer (FSCM) exceed the space in card columns 8 through 22 of A02/A0B requisitions, prepare an A05/A0E requisition (DD Form 1348-6) and mail it to Commander, Defense Construction Supply Center, ATTN: DCSC-OSR, Columbus, Ohio 43215.

3-6. Rexnord Cross Reference Number System. An explanation of Rexnord Prefix and Suffix is available in Appendix G.

APPENDIX A

PUBLICATIONS

DA EQUIPMENT PUBLICATIONS		
NOMENCLATURE	EQUIPMENT PUBLICATION NUMBER	DATE AVAILABLE
Utilization of Engineer Construction Equipment: Volume A, Earthmoving, Compaction, Grading and Ditching Equipment.	TM5-331A	18 Aug 67
Charging System Trouble Shooting (The Easy Way)	DA Pamphlet 750-53	Dec 1976
NOTE Supervisors and operators should refer to TM5-331A to get the most use from this equipment.		

OTHER THAN OFFICIAL DA EQUIPMENT PUBLICATIONS			
NOMENCLATURE	EQUIPMENT PUBLICATION NUMBER OR TYPE	DATE AVAILABLE	SOURCE OF SUPPLY
	NONE		

APPENDIX B

WARRANTY GUIDELINES

NO

DISTRIBUTOR CONTACT

1. A warranty period of 15 months applies to Self-Propelled Model SP-848 Vibratory Rollers, contract number DLA700-78-C-8327, manufactured by Rexnord Inc. after delivery to the Government. This warranty applies to the end item components and all supplies furnished under the contract.

2. Using units may not contact their local dealer. You must mail DA Form 2407 to the Maintenance Directorate, TARCOM, at the following address: US Army Tank-Automotive Materiel Readiness Command, ATTN: DRSTA-MVB, Warren, Michigan 48090. To expedite actions you may call the information to AUTOVON 273-3387, 3383 or 3439 with the information from your DA 2407, Section 1, Block 1 through 11, Blocks 16, 17, 18 and 20.

3. General Information:

a. DA Form 2407 (prepared in accordance with warranty claim actions in TM 38-750) will be used to submit warranty claims actions for end items when components, parts or assemblies are defective and are covered by a manufacturer's warranty. End items under warranty are identified by a decal plate and/or warranty statement included in the operator's and maintenance manual for the end item. All warranty actions settle or unsettled will be reported to the National Maintenance Point (NMP) on DA Form 2407. For warranties settled locally the DA Form 2407 will contain a statement "For Information Only" in block 35.

b. Maintenance activities in support of organizational maintenance are the responsible points of contact between the originator of warranty claims and the National Maintenance Point (US Army Tank-Automotive Materiel Readiness Command, DRSTA-MVB, AUTOVON 273-3387, 3383 or 3439, Warren, Michigan 48090), which serves as the DA Representative with the contractor in warranty matters.

NOTE: In certain instances, the originating organization and the support activity are one and the same.

c. Before you take your equipment to a dealer for repair, whether or not it was necessary for you to go through the NMP (TARCOM), check with your local procurement office to see if a funds commitment document is needed. Sometimes, even though the majority of the repairs are covered by the warranty, there may be a small charge for normal maintenance costs, i.e., oil filters, oil etc. Further the cause of damage could be determined by the dealer to be directly related to "operator abuse." In that case, the Government may be obligated to pay for teardown services even if

the repairs are no longer desired, or for the complete cost if repairs are to be completed by the dealer.

d. When the equipment is given to the dealer for repairs, find out how long the work will take, the extent of the problem if possible, and the charges, if any, which may be involved. Leave the name and telephone number of the person to be contacted for pickup of the equipment and specifically state that he should be called as soon as the repairs are finished. In addition state he should be telephoned if unexpected problems, costs and/or delays are encountered. Get the name and telephone number of the Service Manager, for any required follow-up purposes.

e. When you arrive to pickup your equipment after completion of services, make certain that you know exactly what repairs were performed and/or parts replaced. This is required for overall problem trend evaluation by the NMP and must be identified upon completion of warranty services.

f. Telephone the NMP at TARCOM, AUTOVON 273-3387, 3383 or 3439. if:

(1) Your equipment requires repairs and you cannot obtain these services using the procedures listed above.

(2) The length of time required for repairs may seriously hamper your mission, or if the dealer's overall response to your requirements are not satisfactory.

(3) You have any questions regarding warranty procedures - either in general or about a specific job. Do not wait until your problems become critical.

g. Do not attempt to conduct negotiations regarding a breach of warranty. This is a function of the Contracting Officer, through the NMP at TARCOM.

APPENDIX C

MAINTENANCE ALLOCATION CHART

FOR

ROLLER, VIBRATORY, SELF-PROPELLED

Section I. INTRODUCTION

1. General: This Maintenance Allocation Chart designates responsibility for performance of Maintenance functions to specific Maintenance categories.

2. Maintenance functions:

a. Inspect: To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test: To verify serviceability and detect incipient failures by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service: Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust: To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align: To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate: To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install: The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace: The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair: The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul: That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild: Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc) considered in classifying Army equipments/components.

3. Column entries: Columns used in the Maintenance allocation chart are explained below:

a. Column 1, Group Number: Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly: Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions: Column 3 lists the functions to be performed on the item listed in Column 2.

d. Column 4, Maintenance Category: Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in Column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate "work time" figures will be shown for each category. The number of manhours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the Maintenance Allocation Chart.

e. Column 5, Tools and Equipment: Column 5 specifies by code those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks: Column 6 contains an alphabetic code which leads to the remark in Section IV, Remarks, which is pertinent to the item opposite the particular code.

Section II. MAINTENANCE ALLOCATION CHART
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
01	ENGINE								
0100	Engine Assembly	Test		2.0				1,2,3	
		Service	0.1						
		Replace			16.0				
		Repair			21.0				
		Overhaul				48.0			
	Engine Mounts	Replace		3.0					
0101	Cylinder Block	Test				5.0		1,2,3	
		Replace				4.0			
		Repair				20.0			
	Cylinder Sleeve	Replace				3.0			
	Cylinder Head	Replace			4.0				
		Repair				4.0			
		Overhaul				8.0			
0102	Crankshaft	Replace				5.0		1,2,3	
	Main Bearings	Replace				4.0			
	Drive Pulley	Replace		2.0					
0103	Flywheel	Replace			3.0			1,2,3	
0104	Pistons & Connecting Rods	Repair				3.0			
		Replace				2.0		1,2,3	

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot
*Worktimes are included in PMWR

Section II. MAINTENANCE ALLOCATION CHART
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT
SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY*					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
	Rings and Bearing	Replace				0.5			
0105	Rocket Arms	Replace			0.5			1,2	
	Valve Springs	Test				0.8			
		Replace				0.3			
	Valves, Exhaust	Adjust			2.0				
		Replace				1.0			
		Repair				2.0			
	Camshaft, bearings, and gears	Replace				4.0			
0106	Oil Cooler	Service		.2				1,2	
		Replace			1.0				
	Oil Pan	Replace			1.5				
		Repair			1.0				
	Oil Pump	Replace			0.8				
		Repair			2.0				
	Oil Pressure Regulator	Adjust			0.2				
		Replace			0.5				
	Oil Filter Assy	Service		0.2					
		Replace			1.0				

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY*					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
	Oil Filter Element	Replace		0.5					
0108	Exhaust Manifold	Replace			1.0			1,2,3	
		Repair			1.0				
03	FUEL SYSTEM								
0301	Fuel Injector	Test			1.0			1,2,3	
		Replace			1.0				
0302	Fuel Pump	Replace		1.0				1,2	
		Repair				1.0			
0304	Air Cleaner	Service	0.4					1	
		Replace		1.0					
		Repair		0.5					
	Air Cleaner Element	Replace	0.5						
0305	Blower Air Intake	Service		0.3				1	
		Replace			1.0				
		Repair			2.0				
	Air Shut-Down	Adjust			0.5				
		Replace			1.5				
		Repair			2.0				
0306	Fuel Tank	Service	0.2					1,2	
		Replace		1.5					
		Repair			2.0				

*The subcolumns are as follows:
C- operator/crew
O--organizational
F- direct support
H--general support
D--depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART

ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
	Lines and Fittings	Replace		1.0					
		Replace		1.0					
0308	Governor, Engine Speed	Test			0.5			1,2	
		Adjust			0.5				
		Replace			1.0				
		Repair				2.0			
0309	Fuel Filters	Service	0.2					1,2	
	Fuel Filter Element	Replace		0.5					
0312	Throttle Control Linkage	Adjust		0.5				1	
		Replace		0.5					
		Repair		0.5					
04	EXHAUST SYSTEM								
0401	Muffler & Exhaust Pipes	Replace		1.0				1	
		Repair		1.0					
05	COOLING SYSTEM								
0501	Radiator	Service	0.2						
		Replace			2.0				
		Repair				2.0			

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART

ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY*					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
0503	Thermostat	Replace		1.0				1	
	Hoses and Clamps	Replace		0.5					
0504	Water Pump	Replace		2.0				1	
		Repair			1.0				
0505	Fan Assembly	Replace		1.0				1	
		Repair			1.0				
	Fan Guard	Replace		1.0					
		Repair		1.0					
	Fan Belts	Inspect		0.1					
		Adjust		0.5					
		Replace		1.0					
06	ELECTRICAL SYSTEM								
0601	Alternator	Test		0.5				1,5	
		Replace		0.6					
		Repair			1.5				
0603	Starting Motor	Test		0.5					
		Replace		1.0				1,5	
		Repair			1.5				
		Adjust			0.5				
		Replace			1.0				

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART

ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
0607	Instrument Panel Accessories	Replace		0.5				1	
		Repair		0.5					
0608	Miscellaneous Electrical Items (switches, circuit breakers, etc)	Replace		0.5				1	
		Repair		0.5					
0609	Headlight Assembly	Replace		0.3				1	
		Repair		0.5					
	Headlight Lamp Units	Replace		0.3					
0610	Sending Units/warning switches	Replace		0.5				1	
0611	Horn Assembly	Replace		0.5				1	
		Repair		0.5					
0612	Battery	Test		0.3				1	
		Inspect	0.1						
		Service	0.2						
		Replace		0.5					
	Battery, Cables	Replace		0.4					
		Repair		0.5					
0613	Wiring Harness	Replace			1.0			1	
		Repair		0.5				5	

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART

ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACTS, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
07	TRANSMISSION SYSTEM								
0700	Transmission Assembly	Test			1.0			1,2	
		Service		0.5					
		Replace			4:0				
		Repair			16.0				
		Overhaul				20.0			
0705	Gear Range Control	Service		0.3				1	
		Adjust		0.5					
		Replace		2.0					
		Repair		2.0					
0721	Hydraulic Oil Reservoir	Service	0.3					1,2	
		Replace			3.0				
		Repair			3.0				
	Hydraulic Oil Filter	Replace		1.0					
	Hydrostatic Pump (Propelling)	Replace			2.0				
		Repair			2.0				
		Overhaul				4.0			
	Hydrostatic Motor (propelling)	Replace			1.5				
		Repair			2.0				

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C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
		Overhaul				4.0			
	Hydraulic Oil Cooler	Service		0.2					
		Replace			2.0				
		Repair			2.0				
	Direction/speed control assembly	Service		0.5					
		Adjust		1.0					
		Replace		2.0					
		Repair		2.0					
	Pressure Relief Valve	Replace		1.0					
	Lines and Fittings	Replace		1.0					
		Repair			1.0				
08	VIBRATORY DRIVE SYSTEM								
0801	Hydrostatic pump (Vibratory)	Replace			2.0			1,2	
		Repair			2.0				
		Overhaul				4.0			
	Jack Shaft, Bearings, Coupling and Sheave	Replace			2.0				
		Repair			2.0				
	Driven Sheave Assy	Replace			3.0				
		Repair			3.0				

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C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY*					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
	Eccentric Shaft Assy	Service	0.2						
		Replace			8.0				
		Repair			8.0				
	Vibratory Control Assy	Service		0.5					
		Adjust		1.0					
		Replace		2.0					
		Repair		1.0					
09	PROPELLOR SHAFT								
0900	Propellor Shaft Assy	Service		0.4				1	
		Replace		1.5					
		Repair		1.0					
11	REAR AXLE								
1100	Rear Axle Assy	Service		0.5				1	
		Replace			8.0				
		Repair			8.0				
1102	Differential Assy	Service		0.5				1,2	
		Replace			8.0				
		Repair			8.0				
12	BRAKES								
1201	Parking Brake Assy	Replace		1.0					
		Repair		1.0				1	

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C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART

ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY*					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
1202	Service Brakes	Replace		1.0					
		Repair		1.0					
1204	Master Cylinder	Service		0.2				1	
		Replace		2.0					
		Repair			1.0				
	Lines and Fittings	Replace		2.0					
		Repair		1.0					
13	WHEELS								
1311	Wheel Assembly	Inspect		0.5				1	
		Replace		1.5					
	Hubs, Bearings & Seals	Service		0.5					
		Adjust		1.0					
		Replace		2.0					
1313	Tires	Inspect		0.2				1	
		Replace		2.0					
		Repair		2.0					
14	STEERING								
1401	Steering Wheel	Replace		1.0				1	
1407	Steering Control Unit	Test			1.0			1,2	
		Replace			2.0				

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C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT	(6) REMARKS
		Repair				4.0			
1410	Hydraulic Steering Pump	Service		0.5				1,2	
		Replace			2.0				
		Repair				4.0			
1411	Hoses Lines and Fittings	Inspect		0.5					
		Replace		1.0					
		Repair			1.0				
1412	Hydraulic Steering Cylinders	Service		0.5				1,2	
		Replace			1.5				
		Repair			2.0				
15	FRAME								
1501	Power Unit Frame	Repair			3.0			1,2	
	Roll Frame Assy	Repair			3.0				
18	BODY, HOOD & COWLING								
1801	Hood and Cowling	Replace		1.0				1,2	
		Repair			2.0				
1806	Seat Assembly	Adjust	0.1					1,2	
		Replace		1.0					
		Repair			1.0				

*The subcolumns are as follows:
C--operator/crew
O--organizational
F--direct support
H--general support
D--depot

**Worktimes are included in DMWR

Section II. MAINTENANCE ALLOCATION CHART
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY*					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
1808	Tool Box	Repair			0.8			1,2	
74	EARTH MOVING EQUIPMENT COMPONENTS								
7466	Roll Scrapers	Service		0.5				1	
		Replace		1.5					
		Repair		1.0					

*The subcolumns are as follows:
C—operator/crew
O—organizational
F—direct support
H—general support
D—depot

**Worktimes are included in DMWR

MAINTENANCE ALLOCATION CHART FOR

ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT, SINGLE SMOOTH DRUM (CCE)

SECTION III - TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
		Unless otherwise noted, all maintenance functions can be accomplished with the tools contained in the following common two sets.		
1	O, F, H	Shop Equip Contact Maint. TRK MTD (SC 4940-97-CL-E-05)	4940-00-294-9518	T10138
1	O, F, H	Shop Equip Org Repair, Light TRK MTD (SC 4940-97-CL-E04)	4940-00-294-9516	T13152
1	O, F, H	Tool Kit Automotive Maint, Org Maint Common #1 (SC 4910-95-CL-A74)	4910-00-754-0654	W32593
1	O, F, H	Tool Kit Automotive Maint, Org Maint Common #2 (SC 4910-95-CL-A72)	4910-00-754-0650	W32730
1	O, F, H	Tool Kit, Light Weight (SC 5180-90-CL-W26)	5180-00-177-7033	W33004
1	O, F, H	Shop Equip Auto Maint and Repair Org Maint Supp #1 (SC 4910-95-CL-A73)	4910-00-754-0653	W32867
1	O, F, H	Shop Equip Welding Field Maint (SC 3470-95-CL-A08)	3470-00-357-7268	T16714
1	O, F, H	Tool Set, Veh Full Tracked Sugg #2 SC 4940-95-CL-A08	4940-00-754-0743	W65747
2	F, H	Shop Equip Gen Purp Repair Semitrlr MTD (SC 4940-97-CL-E03)	4940-00-287-4894	T10549
2	F, H	Tool Kit Automotive, Fuel and Elec Sys Repair (SC 4910-95-CL-A50)	4910-00-754-0655	W32456
2	F, H	Tool Kit, Master Mechanic and Equip Maint and Repair (SC 5180-90-CL-E05)	5180-00-699-5273	W45060

MAINTENANCE ALLOCATION CHART FOR
ROLLER, VIBRATORY, SELF-PROPELLED HIGH IMPACT,
SINGLE SMOOTH DRUM (CCE)

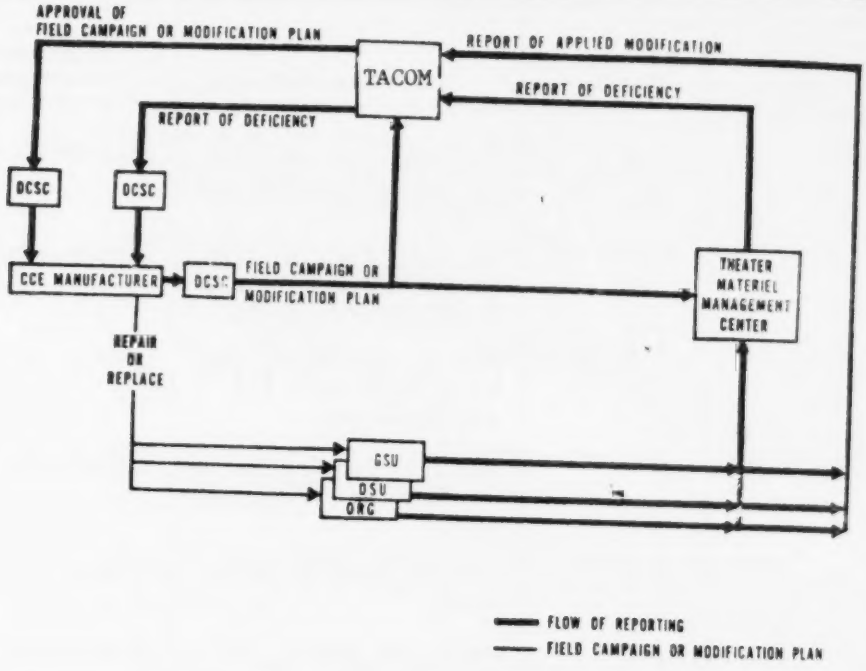
SECTION III - TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
2	F, H	Shop Set, Fuel and Elec Sys Field Maint Basic (SC 4910-95-CL-A01)	4910-00-754-0714	T30414
2	F, H	Shop Set, Fuel and Elec Sys Field Maint Basic Sup #2 (SC 4910-95-CL-A65)	4910-00-390-7775	T30688
2	F, H	Shop Equip Machine Shop, Field Maint Basic (SC 3470-95-CL-A02)	3470-00-754-0708	T15644
2	F, H	Measuring and Lay Out Tool Set, Mach (SC 5280-95-CL-A02)	5280-00-511-1950	W44512
2	F, H	Tool Kit Body and Fender Repair	5180-00-754-0643	W33689
3	F, H	Wrench Set Socket, 3/4" Drive Hex Type	5310-00-754-0743	W65747
4	O, F, H	Wrench Torque, 3/4" Drive 500 lb Cap	5120-00-542-5577	Y84966
5	O, F, H	Multimeter	6625-00-999-7465	M80242

STA , FORM 1 FEB 76 4801A PREVIOUS EDITIONS OF THIS FORM MAY BE USED

APPENDIX D

CCE MANUFACTURER FIELD CAMPAIGNS AND MODIFICATION PROCEDURES



APPENDIX E

BASIC ISSUE ITEMS LIST

NOMENCLATURE:
MANUFACTURER:
SERIAL NUMBER RANGE:
DATE:

(1) MFR PART NO.	(2) MFR FED CODE	(3) DESCRIPTION	(4) UNIT OF ISSUE	(5) QUANTITY FURNISHED W/EQUIP
298-316-47	53786	Grease Gun	Ea	1

ITEMS TROOP INSTALLED OR AUTHORIZED LIST

(1) SMR CODE	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION REF No & MFR CODE / USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY AUTH
		NOTE: The following items are overpacked with the Roller.		
	7520-00-559-9618	Case, Cotton Duck: MIL-B-11743 (81349)	ea	1
	7510-00-889-3494	Log Book Binder: MIL-B-43064	ea	1
		NOTE: The following items are authorized but not issued with the Roller.		
	4210-00-889-2221	Extinguisher, Fire Dry Chemical	ea	1

APPENDIX F

MAINTENANCE AND OPERATING SUPPLY LIST

NOMENCLATURE: Roller, Vibratory, Self Propelled	MAKE: Rexnord Inc.	MODEL: SP-848
MFR PART NO: SP-848	NSN: 3895-01-075-2823	SERIAL NO. RANGE: ——— TO ———
		DATE: June 79

(1) COMPONENT APPLICATION	(2) MFR PART NO. OR NAT'L STOCK NO.	(3) DESCRIPTION	(4) QTY REQ F/INITIAL OPN	(5) QTY REQ F/8 HRS OPN	(6) NOTES
Engine Crankcase	9150-00-188-9858	Oil, Lubricating OE/HD030 MIL-L-2104C	14 Qts	0	General Suc: 5 gal
	9150-00-186-6668	Oil, Lubricating OE/HD010 MIL-L-2104C	14 Qts	0	Low Temp: 5 gal
Brake Master Cylinder	9150-00-242-7602	Brake Fluid Automotive VV-B-680	1 Pt.	0	
Two Speed Transmission	9150-01-035-5393				
Axle Differential	9150-01-035-5393				
Planetary Wheel Ends	9150-01-035-5393	Gear Lubricating Oil/GO80-90	9½ Qts	0	Temp Range - 30F and up
Hydraulic Oil System	9150-00-657-4959	Automotive Trans Fluid (Dexron Type A)	34 Gal	0	5 Gal
Fuel Tank	9150-00-286-5296	Diesel Fuel, DF2	55 Gal	40 Gal	55 Gal Drum
Cooling System	6850-00-181-7933	Anti-Freeze, Permanent MIL-A-46153	5.25 Gal	0	50-50 Solution

MAINTENANCE AND OPERATING SUPPLY LIST

NOMENCLATURE: ROLLER, VIBRATORY, SELF-PROPELLED	MAKE: REXNORD, INC.	MODEL: SP-848
MFR PART NO: SP-848	NSN: 3895-01-075-2823	SERIAL NO. RANGE: ——— TO ———
		DATE: n June 79

(1) COMPONENT APPLICATION	(2) MFR PART NO. OR NAT'L STOCK NO.	(3) DESCRIPTION	(4) QTY REQ F/INITIAL OPN	(5) QTY REQ F/8 HRS OPN	(6) NOTES
Roller Bearings	9150-00-109-0905				
Universal Joints and Slip Joints	9150-00-109-0905				
Articulating Joints	9150-00-109-0905				
Steering Cylinder Ends	9150-00-190-0905	GAA Grease Mil-G-10924C	as Req	as Req	
Vibrator Shaft Bearings		EP#2 (Shell Darina)	as Req	as Req	EP#2 (Shell Darina) is highly recommended as the grease for the Vib. Bearings by the MFR.

REXNORD CROSS REFERENCE NUMBER SYSTEM

APPENDIX G

298 Numbers - Any number with a "298" prefix is a purchased part. Similar to the old "X" number, i.e., X7769.

102 Numbers - Any number with a "102" prefix is a part made from a single piece of material or a purchase part made especially for Rexnord Inc. Similar to the old series numbers without either a prefix or suffix letter.

402 Numbers - Any number with a "402" prefix is either a forging or a casting. Similar to the old series number with a letter suffix, i.e., "86537Z".

502 Numbers - Any number with a "502" prefix is a weldment made from two or more pieces of material. Similar to the old series number with a "A" prefix, i.e., A266607.

602 Numbers & Mat'l List - Any number with a "602" prefix is an assembly drawing. If the "602" number has a number suffix, i.e., 602-2078-1 it is a material list and designates an assembly that can be taken apart. Similar to the old series numbers with a "B" prefix, i.e., B266608.

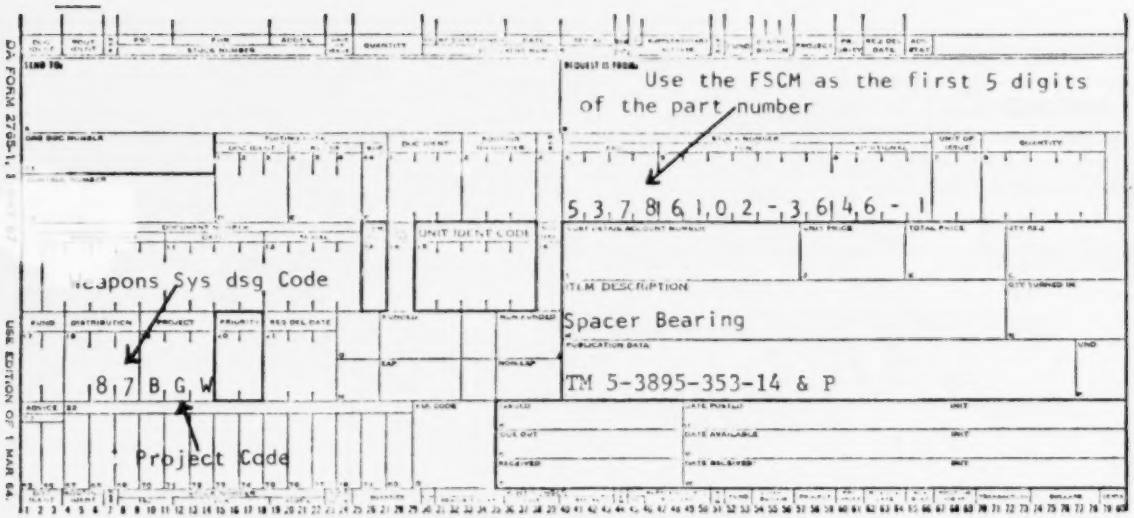
702 Numbers & Mat'l List - Any number with a "702" prefix is a number used to collect a group of parts used in more than one place. Similar to the old "C" number, i.e., C14407.

802 Number & Mat'l List - Any number with an "802" prefix is a number used for designating different units to make up a particular machine. An "802" number is the only style number to appear on indexes. Similar to the old "E" numbers, i.e., E5569.

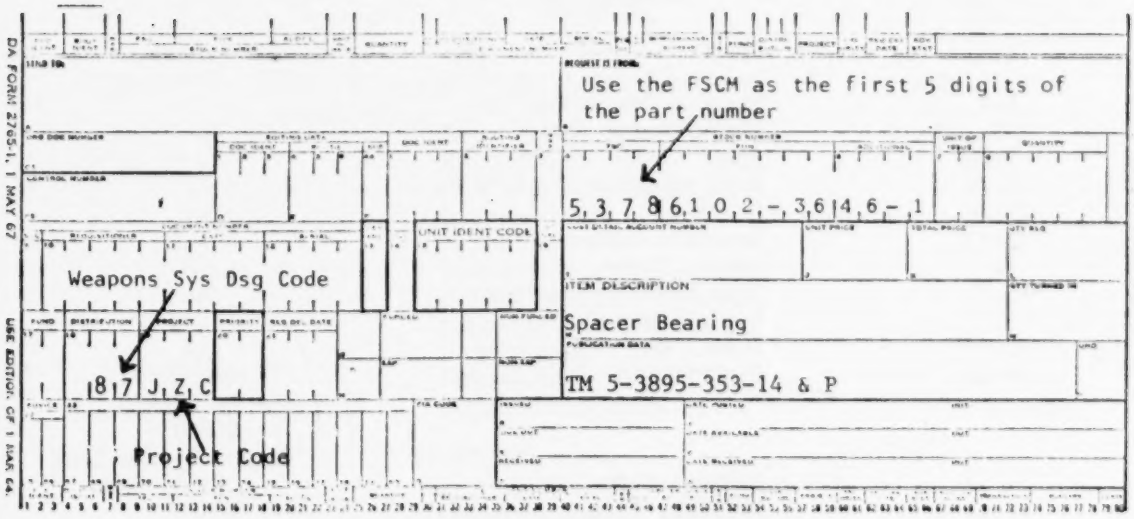
APPENDIX H

SAMPLE FORMAT - DA FORM 2765 PART NUMBER REQUEST

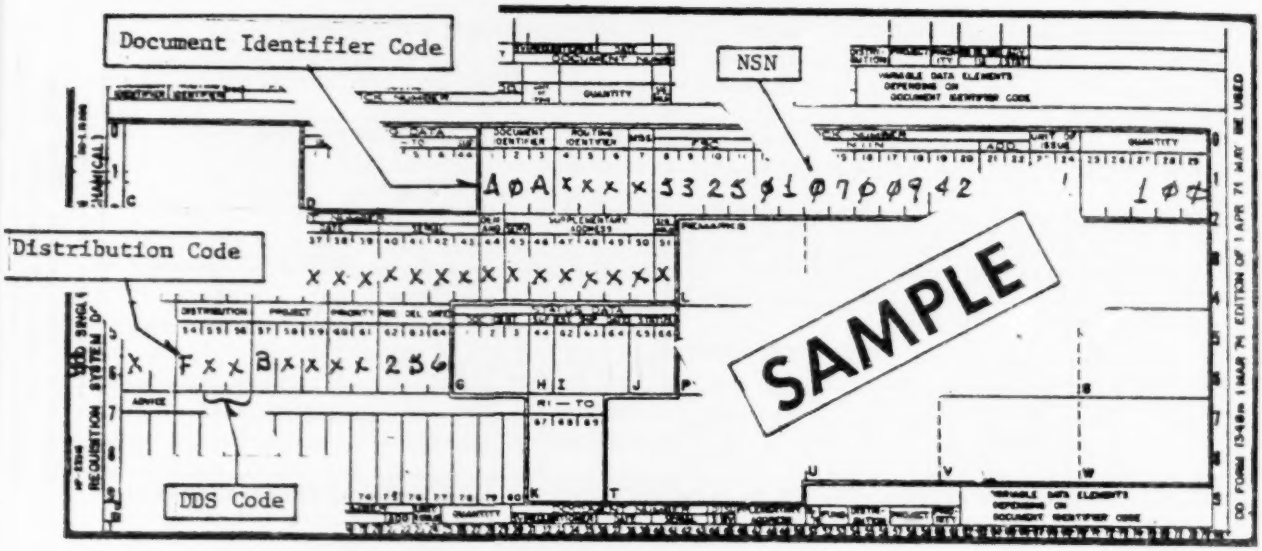
(CONUS REQUESTER)


Use the FSCM as the first 5 digits of the part number
5,3,7,8,6,1,0,2,-,3,6,4,6,-,1
Weapons Sys dsg Code
8,7,B,G,W
Project Code
Spacer Bearing
TM 5-3895-353-14 & P
DA FORM 2765-1, 1
USE EDITION OF 1 MAR 64.
PRESS HARD
USE TYPEWRITER OR BALL POINT PEN
TO ASSURE LEGIBILITY ON ALL COPIES

(OCONUS REQUESTER)

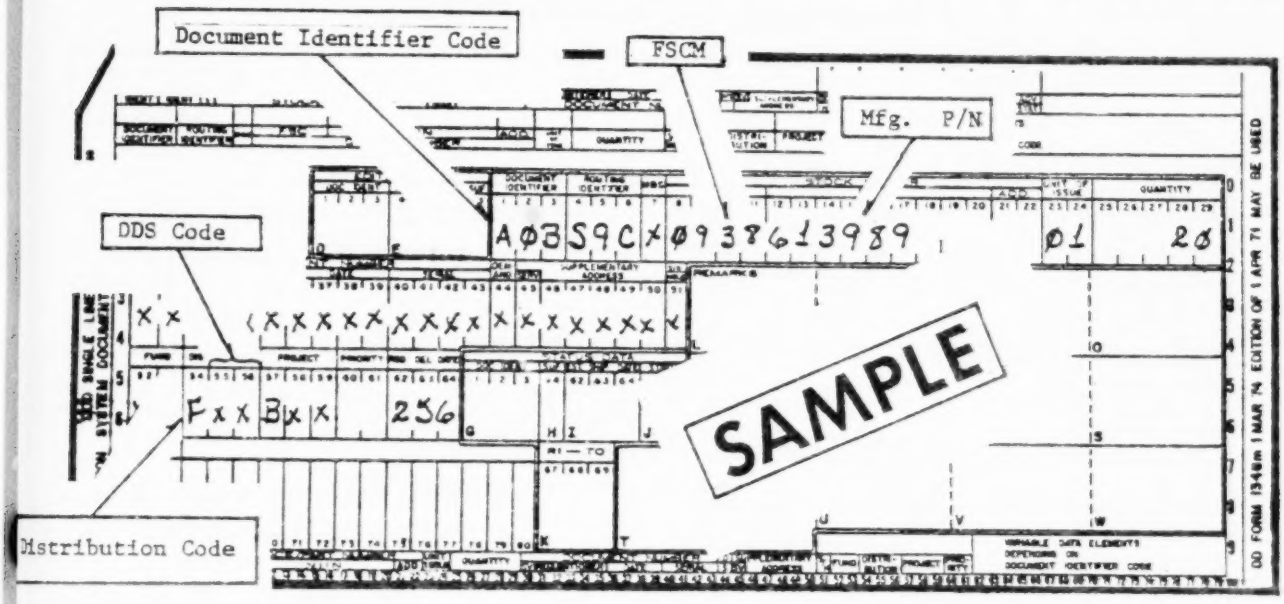

Use the FSCM as the first 5 digits of the part number
5,3,7,8,6,1,0,2,-,3,6,4,6,-,1
Weapons Sys Dsg Code
8,7,J,Z,C
Project Code
Spacer Bearing
TM 5-3895-353-14 & P
DA FORM 2765-1, 1 MAY 67
USE EDITION OF 1 MAR 64.
PRESS HARD
USE TYPEWRITER OR BALL POINT PEN
TO ASSURE LEGIBILITY ON ALL COPIES

SAMPLE FORMAT - MILSTRIP REQUISITION FOR CCE (NSN)



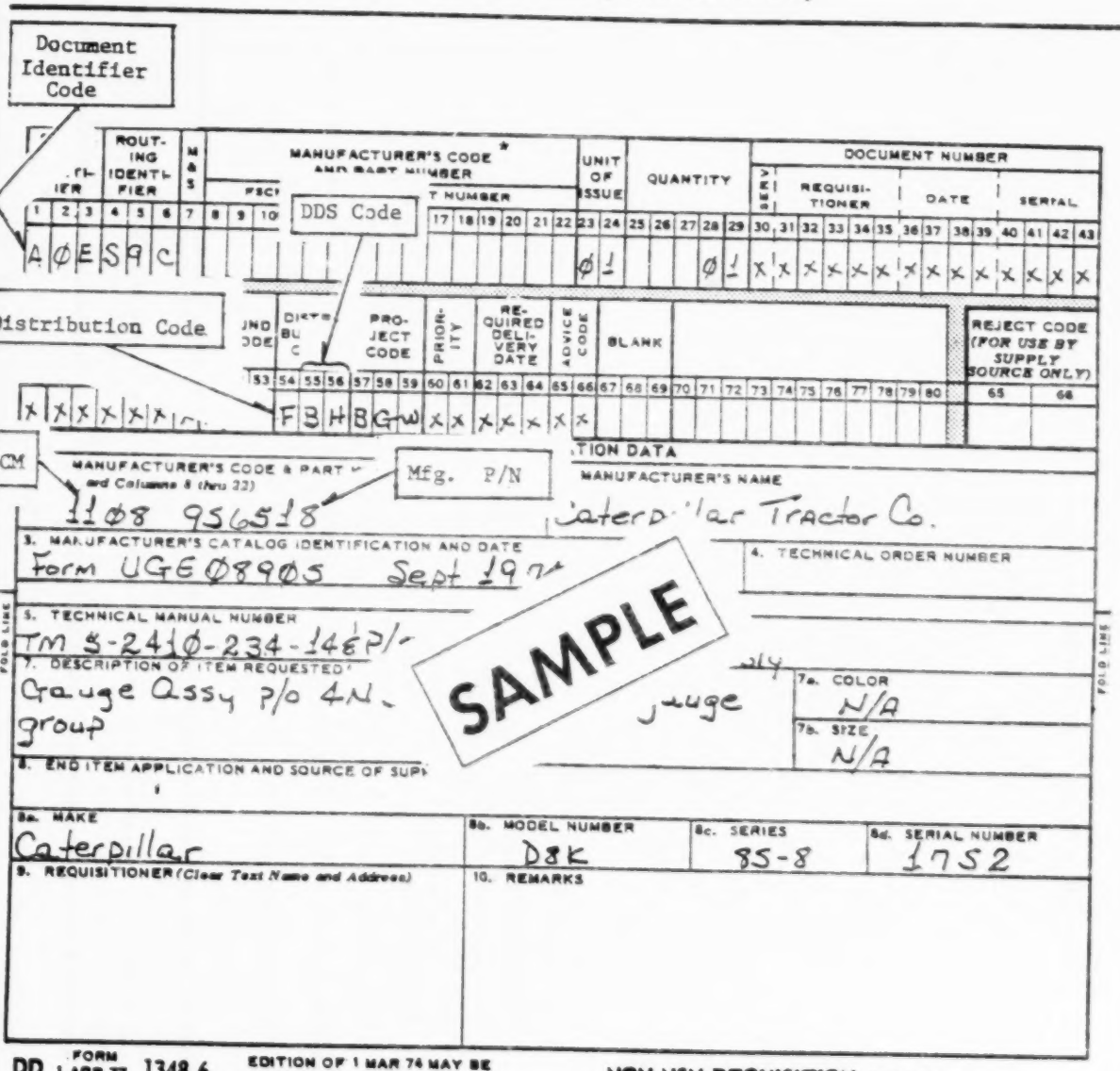
CARD COLUMN	DESCRIPTION OF DATA	MANDATORY ENTRY FOR CCE
1-3	Document Identifier Code	AØA - CONUS AØ1 - Overseas
4-6	Routing Identifier Code	
7	Media/Status Code	
8-22	NSN	
23-24	Unit of Issue	
25-29	Quantity	
30-43	Document Number	
44	Demand Code	
45-50	Supplementary Address	
51	Signal Code	
52-53	Fund Code	
54-56	Distribution Code CC-54	"F" for CONUS; see AR 725-50 for OCONUS
	CC-55-56	Weapon System Code (DSS) Code
57-59	Project Code	
60-61	Priority Code	
62-64	Required Delivery Date	
65-66	Advice Code	

SAMPLE FORMAT - MILSTRIP REQUISITION FOR CCE (NON-NSN)



CARD COLUMN	DESCRIPTION OF DATA	MANDATORY ENTRY FOR CCE
1-3	Document Identifier Code	AØB - CONUS AØ2 - Overseas
4-6	Routing Identifier Code	Always S9C
7	Media/Status Code	
8-22	FSCM and Part Number	
23-24	Unit of Issue	
25-29	Quantity	
30-43	Document Number	
44	Demand Code	
45-50	Supplementary Address	
51	Signal Code	
52-53	Fund Code	
54-56	Distribution Code CC-54	"F" for CONUS; see AR 725-50 for OCONUS
	CC-55-56	Weapon System Code
57-59	Project Code	CCE (DSS) Code
60-61	Priority Code	
62-64	Required Delivery Date	
65-66	Advice Code	

SAMPLE FORMAT - MILSTRIP REQUISITION FOR CCE (NON-NSN) (MANUAL)



DOCUMENT IDENTIFIER	ROUTING IDENTIFIER	M&S	MANUFACTURER'S CODE AND PART NUMBER (FSCM / PART NUMBER)	UNIT OF ISSUE	QUANTITY	DOCUMENT NUMBER (SUFFIX / REQUISITIONER / DATE / SERIAL)
AØESAC				Ø1	Ø1	XXXXXXXXXXXXX

DISTRIBUTION CODE	SUPPLEMENTARY ADDRESS	PROJECT CODE	PRIORITY	REQUIRED DELIVERY DATE	ADVICE CODE	BLANK	REJECT CODE (FOR USE BY SUPPLY SOURCE ONLY)
FBHBGW	XXXXXX						

MANUFACTURER'S CODE & PART NUMBER (and Columns 8 thru 22): 1108 956518

MANUFACTURER'S NAME: Caterpillar Tractor Co.

3. MANUFACTURER'S CATALOG IDENTIFICATION AND DATE: Form UGEØ8905 Sept 197

4. TECHNICAL ORDER NUMBER:

5. TECHNICAL MANUAL NUMBER: TM 5-2410-234-14&P/-

7. DESCRIPTION OF ITEM REQUESTED: Gauge Assy P/O 4N-group

7a. COLOR: N/A

7b. SIZE: N/A

8. END ITEM APPLICATION AND SOURCE OF SUPPLY

8a. MAKE	8b. MODEL NUMBER	8c. SERIES	8d. SERIAL NUMBER
Caterpillar	D8K	8S-8	1752

9. REQUISITIONER (Clear Text Name and Address)

10. REMARKS

DD FORM 1 APR 77 1348-6 — EDITION OF 1 MAR 74 MAY BE USED UNTIL EXHAUSTED

NON-NSN REQUISITION (MANUAL)

PRESCRIBED LOAD LIST (PLL)
AUTHORIZED STOCKAGE LIST (ASL)

END ITEM: Self-Propelled Vibratory Roller	MAKE: Rexnord Inc.	MODEL: SP-848
MFR PART NO: None	NSN: 3895-01-075-2823	SERIAL NUMBER RANGE _____ TO _____
		DATE June 79

SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	PART DESCRIPTION		U/M	QTY OF PARTS REQ'D FOR NO. OF END ITEMS			
							PLL	ASL		
							1-5	1-5	6-20	21-50
PAOZZ	2940-00-129-9757	P11-8159	18265	Element, Air Cleaner	$34.55	EA	1	1	2	3
PAOZZ	5330-00-727-3958	P10-1401	18265	Gasket, Air Cleaner Pan	4.45	EA	1	1	2	3
PAOZZ	2910-00-792-8985	5574961	72582	Element, Fuel Strainer	3.98	EA	1	1	2	2
PAOZZ	2910-00-890-2436	5573261	70040	Element Fuel Filter	3.52	EA	1	1	2	2
PAOZZ	4330-01-032-4504	M-2801	92863	Element, Filter Hydraulic	20.40	EA	1	1	2	2
PAOZZ	2940-00-019-8087	5574978	72582	Element, Oil Filter	5.18	EA	1	1	2	2
PAOZZ	3030-00-865-2470	5131395	72582	Belt, V, Matched Set (.5"x41")	3.55	SE	1	1	2	2

APPENDIX M
PREVENTIVE MAINTENANCE CHECKS AND SERVICES

1. Do your (B) PREVENTIVE MAINTENANCE just before you operate the equipment Pay attention to the CAUTIONS and WARNINGS.

2. Do your during (D) PREVENTIVE MAINTENANCE while you operate the equipment and at halts or rest stops.

3. Do your after (A) PREVENTIVE MAINTENANCE right after operating the equipment. Pay attention to the CAUTIONS and WARNINGS.

4. Do your (W) PREVENTIVE MAINTENANCE weekly.

5. Do your (M) PREVENTIVE MAINTENANCE once a month.

6. If something doesn't work, troubleshoot it with the instructions in this manual or notify your supervisor.

7. Always do your PREVENTIVE MAINTENANCE in the same order, so it gets to be a habit Once you've had some practice, you'll spot anything wrong in a hurry.

8. If anything looks wrong and you can't fix it, write it on your DA Form 2404. If you find something seriously wrong, report it to organizational maintenance RIGHT NOW.

9. When you do your PREVENTIVE MAINTENANCE, take along the tools you need to make all the checks. You always need a rag or two.

10. Keep it clean: Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use dry-cleaning solvent (SD-2) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

11. Bolts, nuts, and screws: Check them all for obvious looseness, missing, bent or broken condition. You can't try them all with a tool, of course. But look for chipped paint, bare metal, or rust around bolt heads.

12. If you find one you think is loose, tighten it, and report it to organizational maintenance.

13. Welds: Look for loose or chipped paint, rust, or gaps where parts are welded together. If you find a bad weld, report it to organizational maintenance.

14. Electric wires and connectors: Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure the wires are in good shape.

15. Hoses and fluid lines: Look for wear, damage, and leaks, and make sure clamps and fittings are tight. Wet spots show leaks, of course. But a stain around a fitting or connector can mean a leak. If a leak comes from a loose fitting or connector tighten it. If something is broken or worn out, report it to organizational maintenance.

16. It is necessary for you to know how fluid leakage affects the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn, then be familiar with them and REMEMBER - WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR!

Leakage Definitions for Crew/Operator PMCS

CLASS I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

CLASS II Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

CLASS III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

EQUIPMENT OPERATION IS ALLOWABLE WITH MINOR LEAKAGES (CLASS I OR II). OF COURSE, CONSIDERATION MUST BE GIVEN TO THE FLUID CAPACITY IN THE ITEM/SYSTEM BEING CHECKED/INSPECTED. WHEN IN DOUBT, NOTIFY YOUR SUPERVISOR.

WHEN OPERATING WITH CLASS I OR II LEAKS, CONTINUE TO CHECK FLUID LEVELS AS REQUIRED IN YOUR PMCS.

CLASS III LEAKS SHOULD BE REPORTED TO YOUR SUPERVISOR OR TO ORGANIZATIONAL MAINTENANCE.

WARNING

DRY CLEANING SOLVENT, SD-2, USED TO CLEAN PARTS IS POTENTIALLY DANGEROUS TO PERSONNEL AND PROPERTY. DO NOT USE NEAR OPEN FLAME OR EXCESSIVE HEAT. FLASH POINT OF SOLVENT IS $100^{\circ}F - 138^{\circ}F$.

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-Before D-During A-After W-Weekly M-Monthly

ITEM NO	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled or adjusted as needed	Equipment is not ready/ AVAILABLE IF:
						NOTE PERFORM WEEKLY AS WELL AS BEFORE PMCS's IF: a. You are the assigned operator but have not operated the equipment since the last weekly. b. You are operating the equipment for the first time.	
1						GENERAL	
	•					a. Visually check for loose wiring or damaged hoses.	
	•	•				b. Look for evidence of fluid leakage (oil, fuel, coolant).	Class III leaks are found. Or any fuel leakage.
2						TIRES	
	•					a. Check for cuts and general condition.	One or more tires missing, flat and/or unserviceable.
	•					b. Check for correct air pressure, 16 PSI on well graded soil, 11 PSI on sandy soil.	
3	•					ENGINE CRANK CASE Check dip stick for proper level. Add oil as necessary to FULL mark.	
4	•					RADIATOR Check coolant level. Add coolant as required. (Level should be approximately 1 inch from bottom of filler neck.)	
5	•					FUEL STRAINER Drain approximately ½ pint to remove sediment and water.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-Before D-During A-After W-Weekly M-Monthly

ITEM NO	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled or adjusted as needed	Equipment is not ready/ AVAILABLE IF:
6	●					VIBRATOR SHAFT BEARINGS Lubricate daily (EP #2 Shell Darina grease highly recommended by MFR).	
7						CONTROLS AND INSTRUMENTS (CHECK FOR PROPER INDICATION AND OPERATION)	Engine coolant or oil pressure indicate abnormal operation.
		●				a. Engine coolant temperature guage 160°-210° F.	
		●				b. Engine oil pressure guage 40-60 PSIG at 1050 RPM (Idle Speed).	
		●				c. Ammeter slight (+) charge.	
		●				d. Frequency meter 1200-1800 VPM.	
		●				e. Engine speed 105.0 RPM - Idle, 2450 RPM - Max	
		●				f. Controls (i.e., steering and shifting) check for proper operation.	
8						AIR FILTER (ENGINE)	
		●				a. Check air cleaner indicator, if red, clean and service element.	
				●		b. Inspect air cleaner element.	Element missing.
9				●		TWO SPEED TRANSMISSION Check oil level. Fill to level plug.	
10					●	V-BELTS Check for frayed, cracked, or broken belts.	

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-Quarterly S-Semiannually A-Annually B-Biennially H-Hours MI-Miles

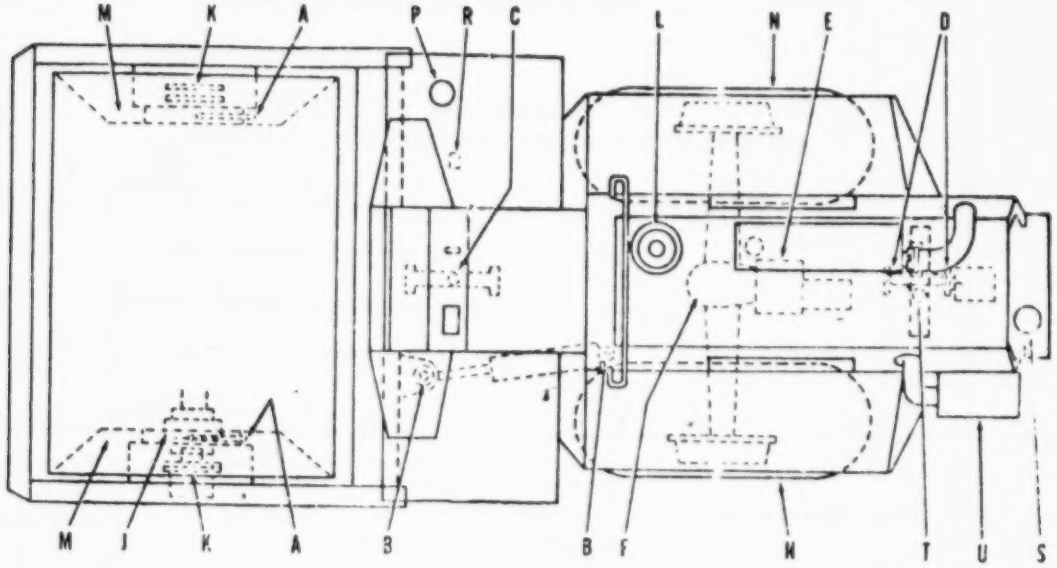
Item No.	Interval						PROCEDURE: ITEM TO BE INSPECTED Check for and have repaired, filled, or adjusted as needed	
	Q	S	A	B	H	MI		
1	●						ENGINE Check for leaks, loose mounts and proper operation.	
2					100		OIL FILTER Change oil filter.	
3					300		FUEL FILTER AND STRAINER Change filter and strainer elements.	
4					200		V-BELTS Check tension.	
5		●					RADIATOR a. Check for leaks and clean exterior as required.	
			●				b. Check antifreeze protection.	
				1000			c. Drain and flush radiator and engine.	
6					500		AIR FILTER a. Primary element should not be cleaned more than 5 times.	
							b. Replace at 6th time.	

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

Q-Quarterly S-Semiannually A-Annually B-Biennially H-Hours MI-Miles

ITEM NO	INTERVAL Q	S	A	B	H	MI	ITEM TO BE INSPECTED PROCEDURE: Check for and have repaired, filled, or adjusted as needed	
7					50		FUEL TANK Drain of any water sediment	
8					1,000		BLOWER SCREEN Clean Screen.	
9					100		BATTERY Check specific gravity of electrolyte in each cell. (more frequently in warm weather).	
10					50		STEERING CYLINDERS a. Check for excessive bearing play. b. Grease both fittings.	
11					500		TWO SPEED TRANSMISSION Drain, flush and fill to level plug (4 qts).	
12					500		AXLE DIFFERENTIAL Drain, flush and fill to level plug (4.5 qts).	
13					500		BRAKE MASTER CYLINDER Drain, flush and fill (1pt).	
14					2,000		HYDRAULIC OIL SYSTEM Drain fluid, change filter and refill.	

REFERENCE POINT	LEVEL OF MAINTENANCE	MIL LUBRICANT	REMARKS
A	C	GAA Grease Mil-G-10924C	Shell Darina EP#2 grease is highly recommended by MFR, but may be substituted by GAA Grease.
B, C, D	C	GAA Grease Mil-G-10924C	
J	O	GAA Grease Mil-G-10924C	NOTE
K	F	GAA Grease Mil-G-10924C	If Shell Darina EP#2 Grease is not used (Ref A) as directed, life expectancy of the Vibrator Shaft Bearings will be reduced Additional Darina grease cartridges are available from Pexnord using P/N 502-223-80 (one case of 10 cartridges).
E, F	C, O	Gear Lub. G080/90	
L	C, O	Dexron Type A	
S	C	Diesel Fuel, DFZ	
T	C	Anti-Freeze Mil-A-46153	50-50 Solution



C - Crew

O - Organizational

F - Field

G - General

LUBRICATION CHART

APPENDIX N

LUBRICATION CHART (Cont)

INDEX OF REFERENCE POINTS

A - Vibrator Shaft Bearing

B - Steering Cylinder Ends

C - Articulating Joints Bearings

D - Universal Joints and Slip Joint

E - Two-Speed Transmission

F - Axle Differential

J - Gear Coupling - Hydraulic Motor to Vibratory Shaft

K - Rollers Bearing

L - Hydraulic Oil System

M - Pneumatic Isolator (25 PSI)

N - Traction Tires

S - Engine Fuel Tank

T - Engine Cooling System

U - Engine Air Cleaner

By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

Official:
J. C. PENNINGTON
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25B, Direct and General Support Maintenance requirements for Roller, Vibratory, Self-Propelled.

☆U.S. GOVERNMENT PRINTING OFFICE : 1989 O - 242-451 (5331)

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

"Your mailing address"

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
"TM 5-XXXX-XXX-XX	"Date of TM"	"Title of TM"

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
400		183	
512			

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Change illustration Reason: Tube end shown assembled on wrong side of lever cam.

Figure 191, item 3 has the wrong NSN. The NSN is not listed in the AMDF or MCRL.

Please give us correct NSN and P/N.

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

John Smith, S. Sgt. 793/xxxx

SIGN HERE

John Smith

DA, FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

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TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter = 100 Sq Millimeters = 0.155 Sq Inches
1 Sq Meter = 10,000 Sq Centimeters = 10.76 Sq Feet
1 Sq Kilometer = 1,000,000 Sq Meters = 0.386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches
1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu Feet

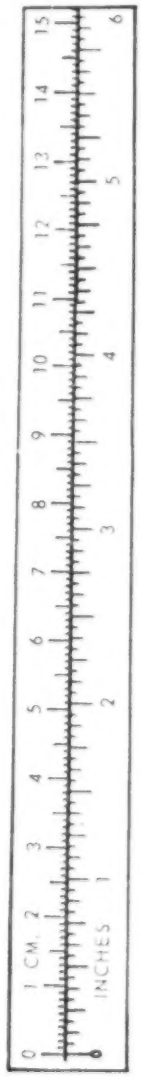
TEMPERATURE

5/9 (^{0}F − 32) = ^{0}C
212^0 Fahrenheit is equivalent to 100^0 Celsius
90^0 Fahrenheit is equivalent to 32.2^0 Celsius
32^0 Fahrenheit is equivalent to 0^0 Celsius
9/5 C^0 + 32 = F^0

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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